

**RESOLUTION NO. 08-176**

**AUTHORIZING THE EXECUTION OF THE  
SAFE HARBOR AGREEMENT FOR VOLUNTARY  
PROTECTION, RESTORATION, AND ENHANCEMENT OF  
HINE'S EMERALD DRAGONFLY HABITAT**

WHEREAS, the District is authorized, pursuant to the powers granted in Section 5 of the Downstate Forest Preserve District Act, 70 ILCS, 805/5 (West 2006), to "hold lands containing one or more natural forests or parts or parts thereof or land or lands connecting such forests of parts thereof, or lands capable of being forested, or capable of being restored to a natural condition, for the purpose of protecting and preserving the flora, fauna, and scenic beauties within the district, and to restore, restock, protect and preserve the natural forests and such lands together with their flora and fauna, as nearly may be, in their natural state and condition, for the purpose of the education, pleasure, and recreation of the public"; and

WHEREAS, the District owns certain property commonly known as Waterfall Glen Forest Preserve that contains lands suitable for restoration; and

WHEREAS, Waterfall Glen Forest Preserve has areas within the preserve where the federally endangered species Hine's Emerald Dragonfly, hereinafter "HED," have been observed; and

WHEREAS, the U. S. Fish and Wildlife Service, hereinafter the "Service," pursuant to the Endangered Species Act of 1973, as amended, is required to develop a Recovery Plan for species listed as endangered; and

WHEREAS, the Endangered Species Act of 1973, as amended, allows the Service to enter into Safe Harbor Agreements for the purposes of encouraging parties to develop and maintain conservation programs for listed species; and

WHEREAS, the District is interested in working with the Service in the recovery of HED; and

WHEREAS, it is in the best interest of the District to enter into a Safe Harbor Agreement with the Service for the purpose of creating and restoring habitat for HED.

NOW, THEREFORE, BE IT RESOLVED, by the President and Board of Commissioners of the Forest Preserve District of DuPage County as follows:

1. The preambles set forth above are incorporated herein and made a part hereof.

2. The Executive Director is hereby authorized and directed to sign on behalf of the District the agreement entitled "Safe Harbor Agreement for Voluntary Protection, Restoration, and Enhancement of Hines's Emerald Dragonfly Habitat Within Waterfall Glen Forest Preserve, DuPage County, Illinois," which is attached hereto and incorporated herein.
3. The President, Executive Director and his staff, and the Attorney for the District are hereby authorized and directed to take such action as may be necessary to fulfill the terms of the said Safe Harbor Agreement.
4. The Secretary is hereby directed to transmit certified copies of this Resolution to the Executive Director, Deputy Director of Natural Resources, Director of the Office of Natural Resources, Attorney for the District, and to U. S. Fish and Wildlife Service, Chicago Metropolitan Wetlands Office, 1250 South Grove Ave. Suite 103, Barrington, IL 60010.

PASSED AND APPROVED by the President and Board of Commissioners of the Forest Preserve District of DuPage County this 15th day of July, 2008.

APPROVED:

  
\_\_\_\_\_  
President

ATTEST:

  
\_\_\_\_\_  
Secretary

Ayes: 7



**SAFE HARBOR AGREEMENT FOR VOLUNTARY PROTECTION, RESTORATION,  
AND ENHANCEMENT OF HINE'S EMERALD DRAGONFLY HABITAT WITHIN  
WATERFALL GLEN FOREST PRESERVE, DUPAGE COUNTY, ILLINOIS**

**I. INTRODUCTION**

This Safe Harbor Agreement (SHA) is made and entered into by the Forest Preserve District of DuPage County (DISTRICT) and the U.S. Department of the Interior, U.S. Fish and Wildlife Service (SERVICE); hereinafter collectively called the "Parties." It was prepared by the Parties to help facilitate on-the-ground conservation of local public land needed for the recovery of the Hine's emerald dragonfly (*Somatochlora hineana*).

The Hine's emerald dragonfly (HED) was listed as endangered by the U.S. Fish and Wildlife Service in January 1995. A Recovery Plan for the species was published in September 2001.

Under Safe Harbor Agreements, participating property owners voluntarily undertake management activities on their property to enhance, restore, or maintain habitat benefiting species listed under the Endangered Species Act of 1973, as amended (ESA). Safe Harbor Agreements encourage private and other non-Federal property owners to implement conservation efforts for listed species by assuring property owners they will not be subjected to increased property use restrictions if their efforts attract listed species to their property or increase the numbers or distribution of listed species already on their property. Application requirements and issuance criteria for ESA section 10(a)(1)(A) enhancement of survival permits based on Safe Harbor Agreements are found in 50 CFR 17.22(c).

Authority

This SHA is entered into pursuant to the SERVICE's final Safe Harbor Policy (64 *Federal Register* 32717) and final regulations (64 *Federal Register* 32706), and implements the intent of the Parties to follow the procedural and substantive requirements of section 10(a)(1)(A) of the ESA.

Sections 2, 7, and 10 of the ESA, as amended, allows the SERVICE to enter into this SHA. Section 2 of ESA states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is a key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of ESA requires the SERVICE to review programs that it administers and to utilize such programs in furtherance of the purposes of ESA. By entering into this SHA, the SERVICE is utilizing its Endangered Species and related programs to further the conservation of the Nation's fish and wildlife resources. Section 10(a)(1) of ESA authorizes the SERVICE to issue enhancement of survival permits for listed species.



conservation efforts or if species subsequently become listed as a threatened or endangered species. Concern centers primarily on the applicability of the section 9 "take" prohibitions if listed species occupy their lands and on future land-use restrictions that may result from their conservation-oriented land management actions if other species are listed. The potential for future restrictions has led property owners to avoid or limit land or water management practices that could enhance or maintain habitat and benefit or attract fish and wildlife that are listed or may be listed in the future.

#### About Hine's emerald dragonfly

##### *Distribution and Status of HED*

The species was originally described from sites in northwestern Ohio (Williamson 1931, Vogt and Cashatt 1994). Historically the species was also known from Indiana, based on museum specimens (Vogt and Cashatt 1994). The HED is currently thought to be extirpated from Ohio and Indiana. A specimen from Alabama is thought to be adventitious. At the time of writing the Recovery Plan, the HED was known from the upper peninsula of Michigan; Door County, Wisconsin; and the lower Des Plaines River valley in Illinois (USFWS 2001). Since that time, additional populations have been discovered and documented in other nearby counties of Wisconsin, the lower peninsula of Michigan, and in Missouri. For most of these sites, population estimates have not been made.

In Illinois, the HED is known to occur at 10 sites (see Figure 2). The Illinois population is within the southern recovery unit (one of two units) for the species. A HED site in Illinois is generally defined as a given forest preserve or land parcel, and may contain more than one suitable or occupied habitat area. The Illinois sites occur along an approximately 10.6 mile length of the lower Des Plaines River valley with the largest populations in the southern part of the area. These sites (generally proceeding downstream) are McMahon Woods, Waterfall Glen Forest Preserve, Black Partridge Forest Preserve, Keepataw Preserve, Romeoville Prairie, Middle Parcel, River South Parcel, Lockport Prairie Nature Preserve, Long Run Seep Nature Preserve, and the Crest Hill Sewage Treatment Plant. McMahon Woods and Black Partridge Forest Preserve are owned by the Cook County Forest Preserve District. These two sites have adult observations of HED, but no documentation of larval presence. Waterfall Glen Forest Preserve is owned and managed by the DISTRICT and contains at least three different areas consisting of habitat where HED adults have been observed, and one habitat that supports HED larvae. Keepataw Preserve is owned and managed by the Forest Preserve District of Will County (FPDWC). It contains a few seepage areas that have been documented as supporting HED larvae. Romeoville Prairie is also managed by the FPDWC. Romeoville Prairie has only observations of HED adults and no confirmed larvae. River South and Middle Parcel are owned by Hanson Material Service (HMS) as part of their Yard 61 property. These areas are known to support adult and larval HED in several different areas with habitat. Lockport Prairie Nature Preserve is managed by FPDWC and has several areas with habitat that support HED larvae. Long Run Seep Nature Preserve is the only site on the east side of the river valley and is owned and managed by the Illinois Department of Natural Resources



The HED spends most of its life as aquatic larvae. The exact length of the larval phase may vary depending on water temperature, food supply, or other factors (Soluk *et al.* 1996, 1998b). It is a relatively long-lived species, requiring approximately 4 years to develop after it hatches from an overwintering egg (Soluk and Satyshur 2005). The larval HED is thought to be a sit-and-wait predator (USFWS 2001), and has been observed to display the greatest amount of activity in the evening and early morning hours (Soluk *et al.* 1999). They have the capability to easily move about a terrestrial environment, a characteristic that may set them apart from other aquatic insect larvae (Soluk *et al.* 1999). Their mobility may assist them in seeking refuge when their stream system dries up.

Invertebrates have been found to utilize refuges within temporary streams to survive drought (Soluk *et al.* 1999). Investigations have revealed that HED larvae use crayfish burrows for such refuge. Soluk *et al.* (1999) developed a method to sample crayfish burrows without damaging the larvae using a bilge pump that has revealed as many as 77 HED larvae in a single burrow. To date, the only crayfish identified in association with burrows used by HED is the devil crayfish (*Cambarus diogenes*) (Soluk *et al.* 1999; Soluk 2004a; Pintor and Soluk 2006); however, other crayfish may also provide the same refuge. These burrows are an integral life requisite for the species because they are essential for overwintering and drought survival (Soluk *et al.* 2004; Pintor and Soluk 2006).

Devil crayfish commonly construct their burrows in marsh or swampy wetland areas. The life history characteristics of the crayfish may also be important in understanding the HED use of these burrows. Devil crayfish move from their burrows to open water during the late summer or fall to copulate and then return to their burrows to overwinter (Threinen 1958). Females lay their eggs in the spring, release their young in open water, and then return to the burrows (Hobbs and Jass 1988). The young-of-the-year remain in open water for part of the summer but begin burrowing as early as midsummer (Soluk *et al.* 1999). The crayfish have been observed to prey upon HED larvae, as would be expected (Soluk 2005). Studies are ongoing, including laboratory observations of burrows in tanks, to determine further details of this relationship between the crayfish and dragonfly larvae.

Larval HED are generalist predators that feed on macroinvertebrates found within or near the rivulet or seepage systems. Soluk *et al.* (1998a) analyzed larval fecal pellets, and their results suggest that the HED is a generalist predator. Larval food was found to include many invertebrate taxa in their habitat including mayflies (Ephemeroptera), aquatic isopods (Arthropoda, order Isopoda), caddisflies (Trichoptera), midge larvae (Diptera), and aquatic worms (Oligochaetes). Amphipods are common in their habitat and are likely diet components (Soluk 2005). In general, dragonfly larvae commonly feed on smaller insect larvae, including mosquito and dragonfly larvae, worms, small fish, and snails (Pritchard 1964; Corbet 1999). HED larvae have been documented to be cannibalistic in laboratory situations (Soluk 2005).



el al. 1996, Mierzwa *et al.* 1997). In northeastern Illinois the peak of adult emergence normally occurs in July, with some variation related to temperature and precipitation patterns. Exuviae (the cast off exoskeleton from emergence to adult form) are often found attached to cattails (*Typha* spp) or other marsh and sedge meadow vegetation 10-60cm above the water or soil surface (Vogt and Cashatt 1994). Teneral (newly emerged) adults often perch on wetland vegetation, shrubs or trees for up to several hours after emergence.

The HED known flight season lasts up to early October in Illinois (Vogt and Cashatt 1994, Soluk *et al.* 1996). Adult HED live at least 14 days (Soluk *et al.* 1996) and may live 4 to 6 weeks (Mierzwa *et al.* 1995a, USFWS 2001). Adult males are often observed in territorial patrols during the summer months. Territorial patrols are usually over low emergent vegetation or rivulets/streamlets. Patrols involve rapid darting over areas and frequent hovering with pivoting while hovering (Vogt and Cashatt 1994). Territories were observed to be defended from intrusion by other HED and other dragonfly species (Vogt and Cashatt 1994).

Adult HED require a sufficient prey base of small flying insects (Vogt and Cashatt 1994; Zuehls 2003). Adult HED feed on the wing, sometimes in swarms, primarily mid-morning to midday and late evening (Zuehls 2003). Foraging behavior is the dominant behavior within swarms, with over 99 percent of dragonflies observed within swarms foraging and swarms are generally found within 0.8 to 1.6 km (0.5 to 1 mile) of breeding sites (Zuehls 2003). Adults will use nearly any natural habitat for foraging near the breeding/larval habitat except open water ponds and closed-canopy forested areas. Preferred foraging habitat consists of various plant communities including marsh, sedge meadow, dolomite prairie, and the fringe of bordering shrubby and forested areas (Mierzwa *et al.* 1995a, 1995b, 1997, 1998; Mierzwa and Copeland 2001; Soluk *et al.* 1996, 1998a; Steffens 1997, 1999, 2000; Thiele and Mierzwa 1999; Vogt and Cashatt 1994, 1999; Vogt 2001). Dragonflies are believed to get water from their food (whose water content is 60 to 80 percent (Fried and May 1983)), although some dragonflies have been observed drinking surface water found in their habitat (Corbet 1999).

HED adults have been documented traveling as much as 5.4 km (3.3 miles) between sites (Lockport Prairie, River South, Middle Parcel) which have intervening roadways, bridges, buildings, railroads and industrial yards (Mierzwa 1995). More recently, adult HED were observed dispersing from Middle Parcel over areas of scantily vegetated slag and stagnant drainage ditches (Mierzwa 2004). Soluk and Swisher (1995) observed HED crossing under and flying parallel to the Route 7 bridge (a smaller bridge near Lockport Prairie) as well as flying over various at-grade roadways in the vicinity. Soluk *et al.* (2008) documented adult HED flying both under and over the new I-355 bridge.

Although natural habitat at one time would have been continuous in the lower Des Plaines River Valley, not all of this habitat was suitable for use by HED. Probably the most important barriers were ponds or other large expanses of open water, where competition and territorial encounters with other, more common dragonfly species can be intense; and the interior of dense shrub thickets or forested areas, where flight and



mid-day and evening hours. Foraging was the dominant behavior within swarms, with over 99% of individuals exhibiting foraging behavior. Prey abundance and mass varied by location and prey type. Swarms were generally found within 0.8 to 1.6 km (0.5 to 1 mile) of larval habitat.

Mating was observed during swarms, but at a relatively low frequency and Zuehls (2003) provides details on various forms of mating behavior observed. Predation events were rare and the frequency of attack was the same when swarms were present or absent, however, the attack rate per individual was lower within swarms at times when attacks occurred. The primary behavior observed in swarms is foraging, but there may also be adaptive value to swarms in protection from predators.

### *Foraging*

Adult HED require a sufficient prey base of small dipterans and other small flying insects (Vogt and Cashatt 1994; Zuehls 2003). Adult HED feed on the wing primarily in mid-morning to midday and late evening (Zuehls 2003). The crepuscular feeding swarms discussed above also seem to be a major feeding behavior (Vogt and Cashatt 1994, Zuehls 2003). Adults will use nearly any natural habitat for foraging near the breeding/larval habitat except open water ponds and closed-canopy forested areas. Preferred foraging habitat consists of various plant communities including marsh, sedge meadow, dolomite prairie, and the fringe of bordering shrubby and forested areas (Mierzwa et al. 1995a, 1995b, 1997, 1998; Mierzwa and Copeland 2001; Soluk et al. 1996, 1998; Steffens 1997, 1999, 2000; Thiele and Mierzwa 1999; Vogt and Cashatt 1994, 1999; Vogt 2001). Vertical "walls" formed by the edge of two distinctly different heights of vegetation and any roads or trails through the wetland vegetation seem to be favored for foraging (USFWS 2001). Dragonflies are believed to get water from their food (whose water content is 60 to 80 percent (Fried and May 1983)), although some dragonflies have been observed drinking surface water found in their habitat (Corbet 1999).

### Threats to the Species

Fragmentation and destruction of suitable habitat are believed to be the main reasons for this species' Federal endangered status and continue to be the primary threats to its recovery (USFWS 2001). HED habitat is closely associated with surface dolomite deposits, an extractable resource that is often quarried. Developing commercial and residential areas, quarrying, creating landfills, constructing pipelines, and filling of wetlands could decrease the area of suitable habitat available and continue to fragment populations of the HED. Direct loss of breeding or foraging habitat could potentially reduce both adult and larval population sizes. In addition, actions that would fragment habitat and impact adult foraging or dispersal may include, but are not limited to, road construction, and high-speed railroad and vehicular traffic. These activities may adversely affect dispersal resulting in a reduction in fitness and genetic exchange within populations as well as direct mortality of individuals.



habitat. Expansion of existing mines near River South and Keepataw could potentially affect the hydrology of the habitat through dewatering when excavating below the water table (evaporative loss or pumping). Mining is also a threat to some sites in Wisconsin (USFWS 2001).

Contamination from landfills, mines, and surface application of pesticides, road salt, and other chemicals may also be harmful to this species. Due to its relatively long aquatic larval stage, contamination of groundwater and surface water are potential threats. Because groundwater moves relatively slowly through sediments, contaminated water may remain toxic for long periods of time and may be difficult or impossible to treat. High water quality may be an important component of this species' habitat. It is not known if contamination/water quality degradation has been a contributing factor in the decline of larval numbers at LPNP, but it is suspected to have a role.

Transportation and roadways are also a threat to this species, both from direct mortality and by habitat destruction or fragmentation. Adult mortality from direct impacts with vehicles or trains has been documented and may reduce HED population sizes (Steffens 1997, 1998, Soluk *et al.* 1998b, USFWS 2001, Soluk and Moss 2003). At several of the known sites in Illinois, Wisconsin, and Michigan roadways or active railroads are in close proximity to breeding habitat. Mortality rates have been estimated at fairly high rates from vehicle collisions in Door County, Wisconsin (Soluk and Moss 2003). The adults of this species are strong fliers and fairly agile, and can avoid collisions with slower moving vehicles. At two sites in Illinois where railroad tracks pass through breeding habitat, train speeds are restricted to 4-6 miles per hour to avoid mortality of dragonflies.

Loss of important habitat within suitable wetland systems may also threaten this species. Wetland systems with wet prairie, sedge meadow, cattail marsh, and/or hummock habitat, interspersed with native shrubs, appear to be an important part of the overall habitat requirements of the HED. The combination of these habitat types within the wetland systems may be important to the survival of this species. Destruction and degradation of HED habitat can result from threats such as succession and encroachment of invasive species, feral pigs, illegal all terrain vehicles and beaver dams (McKenzie and Vogt 2005).

Actions that would increase succession and encroachment of invasive species could negatively impact the HED and the species' habitat. Such activities could include, but are not limited to, release of nutrients and road salt into the surface water or connected groundwater at a point source or by dispersed release (non-point source), and introduction of invasive species through human activities in the habitat. These activities can result in conditions that are favorable to invasive species and would provide an ecological advantage over native vegetation, fill rivulets and seepage areas occupied by HED larva, reduce detritus that provides cover for larva, and reduce flora and fauna necessary for the species to complete its lifecycle.



would be considered to have a baseline of zero for HED larvae, given that no larval or breeding habitat is currently present.

Adult HED have been observed flying over the fish farm parcel. In 2006, 5 observation stations were setup within the fish farm parcel, with 2 additional stations in the adjacent marsh. The results included 3 positive observations of adult male HED at fish farm parcel stations, with additional positive, probable, and possible sightings of HED adult males over the adjacent marsh. No females were observed. In 2007, 6 observation stations were established and a total of 6 positives, 7 probables, and 9 possible sightings of adult HED were made during 21 observer-hours in July 2007 (Soluk *et al.* 2008).

In its current condition, as stated above, the fish farm parcel does not provide suitable breeding habitat. It is an entirely man-made landscape with artificial ponds, drainage structures and wells, buildings, driveways, and mowed turf grass. The immediately adjoining land included within the enrolled project area was vegetated by a successional mix of trees and shrubs, including many invasive species. The area had a fairly dense canopy and did not have adequate hydrology to support any rivulets. Neither of these areas would be considered optimal adult foraging or roosting habitat, though HED have been observed over the ponds and lawn area. Adult HED have also been observed flying over paved parking lots. Marsh and other wetland habitat that do provide appropriate adult foraging and roosting habitat is found in the remainder of Waterfall Glen Forest Preserve, and throughout the lower Des Plaines River valley in Illinois. It is not considered a limiting resource for the HED.

Thus, the baseline condition for the enrolled lands, the fish farm parcel and adjoining land, is zero

## **VI. RESPONSIBILITIES OF THE PARTIES**

Permittee:

FOREST PRESERVE DISTRICT OF DUPAGE COUNTY:

- 1) Provide an annual report of management activities and HED survey results to the SERVICE.
- 2) If warranted, recommend procedures/actions that may be implemented to further reduce or avoid future take based on any take which occurred as described in past annual reports.
- 3) Provide notification of non-compliance.
- 4) Oversee all work done on the DISTRICT property by third party contractors regardless of funding source.



throughout the restoration efforts. The details of the final design and monitoring program will be reviewed and approved by the SERVICE and the DISTRICT prior to implementation.

### Covered Actions

A leaky artesian well in the northern part of the parcel offers the best opportunity for rivulet creation on this site. Other artesian wells on the property may also provide additional opportunities to create appropriate groundwater fed habitat.

Actions that may or may not be taken as a part of this habitat creation/restoration effort include the following:

- Repair or cap artesian wells to increase water availability for habitat creation.
- Construct a temporary piping system to bring artesian groundwater to a habitat creation site.
- Construct swales or rivulets similar to existing HED habitat that could serve as habitat creation site(s).
- Seed and plant native vegetation around habitat creation area(s).
- Implement selective brush removal and seeding on lands adjacent to a habitat creation site(s) in order to increase accessibility of additional natural rivulets to HED.
- Manage the restored habitat with the most up to date, ecologically sound management practices including, but not limited to, controlled burning, herbiciding, selective tree removal, mowing, etc.
- Remove buildings at the recently acquired 12-acre fish farm parcel to facilitate habitat restoration.
- Repair, maintain, or build new amenities / structures that can serve as educational and enrichment sites for the citizens of DuPage County in a manner compatible with the DISTRICT's mission.
- Restore the fish farm parcel in an effort to expand wetland and upland habitats available to all flora and fauna including HED.
- Acquire lands near existing habitat in order to buffer and protect HED habitat.

The above actions should be covered by this SHA regardless of their feasibility of implementation. Ultimately, the DISTRICT is committed to cooperate with the SERVICE in an effort to achieve the highest benefit for HED. The DISTRICT's actions will be subject to Commission approval and available funding and so the DISTRICT will have final word on the implementation of any of the aforementioned actions on DISTRICT property.

### Monitoring and Reporting

The SERVICE, or designees thereof, will be responsible for annual compliance monitoring relative to verifying that the permittee is carrying out the terms and conditions of the Enhancement of Survival Permit. This SHA and associated ESP will grant the SERVICE, after reasonable prior notice to the DISTRICT, the right to enter



Therefore, the cumulative impact of this SHA and the activities it covers, which are facilitated by the authorized take, will provide a net conservation benefit to HED.

## **XI. CHANGED CIRCUMSTANCES**

### Occupation by Non-Covered or Newly Listed Species

After the SHA is signed and an enhancement of survival permit is issued, a species not addressed in the SHA may occupy enrolled property. If the SERVICE concludes that the species is present as a direct result of the property owner's conservation actions taken under the SHA, the SERVICE will:

- (1) At the request of the DISTRICT, amend the SHA to reflect the changed circumstances and revise the baseline condition description to include the newly listed species in this agreement, as appropriate; and
- (2) Review and revise the permit, as applicable, to address the presence of additional listed species on enrolled property.

Assurances in the permit may not necessarily be extended to a non-covered species if the species was specifically excluded from the original SHA as a result of the participating property owner's request, or its presence is a result of activities not directly attributable to the property owner. In these cases, enhancement or maintenance actions that are specific to the non-covered species under consideration must be developed, and baseline conditions determined that will provide a net conservation benefit to that species. Any substantial change to a Safe Harbor Agreement or a revision to an enhancement of survival permit because of non-covered species would be subject to the same review process (*i.e.*, section 7 of ESA or public review) as the original SHA and enhancement of survival permit.

### Transfer of Ownership

If the DISTRICT transfers ownership of this enrolled property, the SERVICE will regard the new owner as having the same rights and obligations with respect to the enrolled property as the DISTRICT if the new property owner agrees to become a party to the original SHA. Actions taken by the new participating property owner that result in the incidental take of species covered by the SHA would be authorized if the new property owner maintains the baseline conditions. The new property owner, however, would neither incur responsibilities under the SHA nor receive any assurances relative to section 9 (of ESA) restrictions from the SHA unless the new property owner becomes a party to the SHA.

Due to the enrolled property being public lands, obtained with public funds or by transfer from the federal government, this property can only be transferred to another public agency. This SHA commits the DISTRICT to notify the SERVICE of any transfer of ownership at the time of the transfer of any property subject to this SHA. This will allow the SERVICE to contact the new property owner to explain the SHA and to determine whether the new property owner would like to continue the original SHA or enter into a



their best efforts to respond to proposed modifications within [30] days of receipt of such notice. Proposed modifications will become effective upon the other Party's written concurrence.

#### Amendment of the Enhancement of Survival Permit

The Enhancement of Survival Permit (ESP) may be amended to accommodate changed circumstances in accordance with all applicable legal requirements, including but not limited to the ESA, the National Environmental Policy Act, and the SERVICE's permit regulations at 50 CFR 13 and 50 CFR 17. The Party proposing the amendment shall provide a statement describing the proposed amendment, the reasons for it, and an explanation of what, if any, effects the amendment(s) may have on HED. A *Federal Register* notice with a 30-day comment period will be needed for any proposed amendments to the ESP.

#### Permit Relinquishment

If, prior to the expiration of the ESP, DISTRICT ceases to be able to continue to administer this SHA, and no other entity satisfactory to the SERVICE is willing to assume DISTRICT's responsibilities, DISTRICT will relinquish its ESP to the SERVICE.

#### Permit Suspension or Revocation

The SERVICE may suspend or revoke the Permit for any cause in accordance with the laws and regulations in force at the time of such suspension or revocation. The SERVICE, as a last resort, may revoke the ESP if continuation of permitted activities would likely result in jeopardy to HED (50 CFR 13.28(a)). In such circumstances, the SERVICE would exercise all possible measures to avoid revoking the Permit.

#### Baseline Adjustment

Unforeseen circumstances could involve habitat impacts resulting from catastrophic (*force majeure*) events such as hurricanes, flash floods, severe drought, lethal forest fires, or insect/disease epidemics. Such events are beyond the reasonable control of the DISTRICT, and did not occur through fault or negligence, including but not limited to "acts of God" or sudden actions of the elements such as those described above. Such catastrophes could either locally destroy the species population or render the habitat unsuitable, thereby reducing population numbers or occupied acreage below the original baseline conditions. For such circumstances beyond the control of the Parties, the DISTRICT and the SERVICE could agree to revise the baseline conditions to reflect the new circumstances.

#### Remedies

Each Party shall have all remedies otherwise available to enforce the terms of the SHA and the Enhancement of Survival Permit, except that no Party shall be liable in damages for any breach of this SHA, any performance or failure to perform an obligation under this SHA or any other cause of action arising from this SHA.



## XVI. Bibliography

- Cashatt, E.D. 2005. A summary of the 2005 Hine's emerald dragonfly (*Somatochlora hineana*) Survey. Illinois State Museum, Research and Collection Center, Springfield, Illinois 6pp. + appendix.
- Cashatt, E.D. 2006. 2005 Hine's Emerald Dragonfly Survey Annual Report (Permit No. TE 842313-5 Amendment). Illinois State Museum, Research and Collection Center, Springfield, Illinois 5pp. + appendix.
- Cashatt, E.G. 2007. A summary of the 2006 Hine's emerald dragonfly (*Somatochlora hineana*) survey: annual report. Illinois State Museum, Research and Collection Center, Springfield, Illinois 55pp.
- Cashatt, E.D., B.G. Sims, and J.R. Wiker. 1992. Illinois 1992 critical habitat and recovery investigations for the Hine's emerald dragonfly (*Somatochlora hineana* Williamson) Unpublished report to US Fish and Wildlife Service, Illinois State Museum, Springfield, IL 32p.
- Cashatt, E.D. and T.E. Vogt. 1996. Population and habitat monitoring of Hine's emerald dragonfly (*Somatochlora hineana* Williamson) in northeastern Illinois in 1995. Report to U.S. Fish and Wildlife Service. Illinois State Museum, Springfield, IL 77p.
- Cashatt, E.G. and T.E. Vogt. 2001. Description of the larva of *Somatochlora hineana* with a key to the larvae of the North American species of *Somatochlora* (Odonata: Corduliidae). International Journal of Odonatology 4(2):93-105.
- Corbet, P.S. 1962. A biology of dragonflies. H.F. & G. Witherby Ltd. Facsimile reprint 1983 by E.W. Classey Ltd., Oxon, United Kingdom. 247p.
- Corbet, P.S. 1999. Dragonflies: behavior and ecology of Odonata. Cornell University Press, Ithaca, New York. 829 pp.
- Cuthrell, D.L. and M.A. Kost. 2005. Current distribution and status of the Hine's emerald dragonfly (*Somatochlora hineana*) in Michigan: 2004 progress report. Report number 2005-02 to U.S. Fish and Wildlife Service. Michigan Natural Features Inventory, Lansing, MI. 35p.
- Foster, S.E. 2001. Patterns of post-emergence habitat use and behavior in the Hine's emerald dragonfly, *Somatochlora hineana*, a federally endangered species. Master's thesis, University of Illinois at Urbana-Champaign. 63pp.
- Foster, S.E. and D.A. Soluk. 2004. Evaluating exuvia collection as a management tool for the federally endangered Hine's emerald dragonfly, *Somatochlora hineana* Williamson (Odonata: Corduliidae). Biological Conservation 118:15-20.



- Landwer, B.H.P. 2003. Observations of the Hine's emerald dragonfly (*Somatochlora hineana*) in Missouri, 2002. Unpublished report to the Missouri Department of Conservation. 63 pp. + appendix
- Landwer, B.H.P., and T.E. Vogt. 2002. Survey for Hine's emerald dragonfly (*Somatochlora hineana*) larval habitat in the Missouri Ozarks – 2002. Unpublished Report to the Missouri Department of Conservation. 17pp. + appendices.
- McKenzie, P.M. and T. Vogt. 2005. Observations of Hine's emerald dragonfly (*Somatochlora hineana*) in Missouri between 1999 and 2004. *Argia* 17(3):17-21.
- Mierzwa, K.S. 2004. Hine's emerald dragonfly (*Somatochlora hineana*) in Illinois: 2003 population and habitat monitoring. Report to Material Service Corporation, EarthTech. 11p + appendices.
- Mierzwa, K.S. 2005. The Hine's emerald dragonfly (*Somatochlora hineana*) in Illinois: the river south and middle parcels 2004 population and habitat monitoring. Report to Material Service Corporation. EarthTech. 12p.
- Mierzwa, K.S. 2007. The Hine's emerald dragonfly (*Somatochlora hineana*) in Illinois: 2007 population and habitat monitoring at the River South and Middle Parcels. Winzler & Kelly Consulting Engineers, Eureka, CA report to Hanson Material Service. 15pp. + appendices.
- Mierzwa, K.S., V.A. Nuzzo, and B.M. Thiele. 1997. The Hine's emerald dragonfly (*Somatochlora hineana*) in Will County, Illinois: 1996 population and habitat studies. TAMS Consultants, Inc., Chicago, IL. 22p + appendices.
- Mierzwa, K.S., V.A. Nuzzo, and B. M. Thiele. 1998. The Hine's emerald dragonfly (*Somatochlora hineana*) in Will County, Illinois: 1997 population and habitat studies. TAMS Consultants, Inc. Chicago, IL. 39p + appendices.
- Mierzwa, K.S., A.P. Smyth, C. Ross, E.D. Cashatt, T.E. Vogt, and A.V. Gochee. 1995b A population and habitat study of the Hine's emerald dragonfly (*Somatochlora hineana*), at the Material Service Corporation Yard 61 Prairie and nearby sites in Will County, Illinois. TAMS Consultants, Inc., Chicago, IL. 43p.
- Mierzwa, K.S., A.P. Smyth, and E.D. Cashatt. 1995a Population dynamics of the Hine's emerald dragonfly (*Somatochlora hineana*) in Illinois. P. 9-39 in Mierzwa (editor), The Hine's emerald dragonfly in Illinois: an assessment of population dynamics and habitat use. TAMS Consultants, with Illinois State Museum, EA Engineering, Science and Technology, and Native Landscapes. Unpublished report to Material Service Corporation. 112p + appendices.



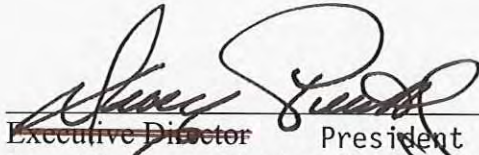
- Soluk, D.A., J.D. Hoekstra, and K. Moss. 2004. Habitat parameters of the Hine's emerald dragonfly (*Somatochlora hineana*): using temperature loggers to assess hydrologic regime in wetlands supporting the larval stages, Lockport Prairie section 206 project. Illinois Natural History Survey Report to U.S. Army Corps of Engineers, Chicago District. 36pp + appendices.
- Soluk, D.A. and K. Moss. 2002. The distribution and quality of Hine's emerald dragonfly habitat in relation to surface and groundwater dynamics in the Lockport Prairie Nature Preserve. Preliminary report (February 2001-January 2002) for Corporation for Openlands, Chicago, IL and U.S. Fish and Wildlife Service. Illinois Natural History Survey, Center for Aquatic Ecology Technical Report 02/01. 15p.
- Soluk, D.A. and K. Moss. 2003. Roadway and exuvial surveys of the Hine's emerald dragonfly (*Somatochlora hineana*) in Door County, Wisconsin: Part II: Roadway fatalities. Final Report (June 2002-August 2002). Illinois Natural History Survey, Center for Aquatic Ecology, Technical Report 03/09, Champaign, IL. 10p.
- Soluk, D.A. and C.D. Satyshur. 2005. Evaluation of the potential impacts of the I-355 extension on the ecology, behavior, and distribution of the endangered Hine's emerald dragonfly (*Somatochlora hineana*) in the Des Plaines River valley. Preliminary report of activities. University of South Dakota report to Illinois State Toll Highway Authority. 19p.
- Soluk, D.A., C.D. Satyshur, J. Holmes, and E. Blas. 2006. The distribution and quality of Hine's emerald dragonfly (*Somatochlora hineana*) habitat in relation to surface and groundwater dynamics in the Lockport Prairie Nature Preserve. University of South Dakota report to Corporation for Openlands, Chicago, IL 142pp + appendices.
- Soluk, D.A. and B.J. Swisher. 1995. The ecology of the Hine's emerald dragonfly (*Somatochlora hineana*): monitoring populations and determining patterns of habitat use in the Des Plaines River valley. Adult activity report (summer 1995). Illinois Natural History Survey, Champaign, IL. 11p + figures.
- Soluk, D.A., B.J. Swisher, and D.S. Zercher. 1996. The ecology of Hine's emerald dragonfly (*Somatochlora hineana*): Monitoring populations and determining patterns of habitat use in the Des Plaines River valley. Activity summary and report of preliminary results (January-August 1996). Illinois Natural History Survey, Champaign, IL 35p.
- Soluk, D.A., B.J. Swisher, D.S. Zercher, J.D. Miller, and A.B. Hults. 1998a. The ecology of Hine's emerald dragonfly (*Somatochlora hineana*): Monitoring populations and determining patterns of habitat use (September 1996- August 1997). Illinois Natural History Survey, Center for Aquatic Ecology Report 98/3. 111pp.

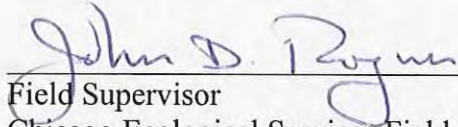


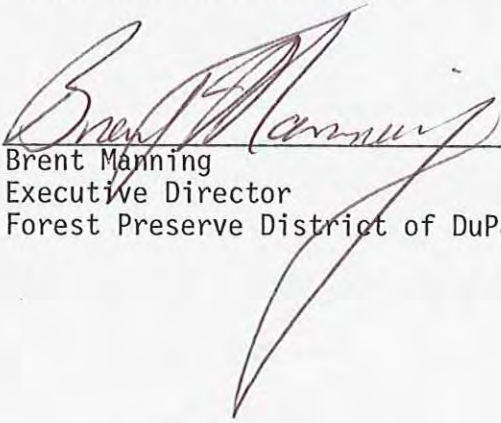
- Vogt, T.E. 2001. The 2001 status survey for the Hine's emerald dragonfly (*Somatochlora hineana*) in the Missouri Ozarks. Report to Missouri Department of Conservation, U.S. Fish and Wildlife Service, and U.S. Forest Service Mark Twain National Forest. 26pp + appendices.
- Vogt, T.E. 2003. A status survey for the Hine's emerald dragonfly (*Somatochlora hineana*) in Missouri – 2002. Report to Missouri Department of Conservation, U.S. Fish and Wildlife Service, and U.S. Forest Service Mark Twain National Forest. 45pp + appendices.
- Vogt, T.E. 2004. A status survey for the Hine's emerald dragonfly (*Somatochlora hineana*) in Missouri – 2003. Report to Missouri Department of Conservation, U.S. Fish and Wildlife Service, and U.S. Forest Service Mark Twain National Forest. 33pp + appendices.
- Vogt, T.E. 2005. Population monitoring and status survey for the Hine's emerald dragonfly (*Somatochlora hineana*) in Missouri – 2004. Report to Missouri Department of Conservation, U.S. Fish and Wildlife Service, and U.S. Forest Service Mark Twain National Forest. 42pp.
- Vogt, T.E. 2006. Population Monitoring and Status Survey for the Hine's Emerald Dragonfly (*Somatochlora hineana*) in Missouri – 2005. Report to Missouri Department of Conservation, U.S. Fish and Wildlife Service, and U.S. Forest Service Mark Twain National Forest. 28pp.
- Vogt, T.E., and E.D. Cashatt. 1990. The Wisconsin 1990 status survey for the Ohio emerald dragonfly (*Somatochlora hineana* Williamson). Report to U.S. Fish and Wildlife Service. Illinois State Museum, Springfield, Illinois. 14pp.
- Vogt, T.E. and E.D. Cashatt. 1994. Distribution, habitat, and field biology of *Somatochlora hineana* (Odonata: Corduliidae). *Annals of Entomological Society of America* 87(5):599-603.
- Vogt, T.E. and E.D. Cashatt. 1997. The 1996 population monitoring and adult ecological studies of Hine's emerald dragonfly (*Somatochlora hineana*) at Material Service Corporation Yard 61, Romeoville, Illinois. Illinois State Museum, Springfield, IL. 24p + appendices.
- Vogt, T.E., and E.D. Cashatt. 1999. The 1997 population monitoring and ecological studies of Hine's emerald dragonfly (*Somatochlora hineana*) at Material Service Corporation Yard 61, Romeoville, Illinois. Illinois State Museum, Springfield, Illinois. 37 pp. + appendices.
- Vogt, T.E., T.H. Holmes, E.D. Cashatt. 1999. The 1998 Population Monitoring and Ecological Studies of Hine's emerald dragonfly (*Somatochlora hineana*) at



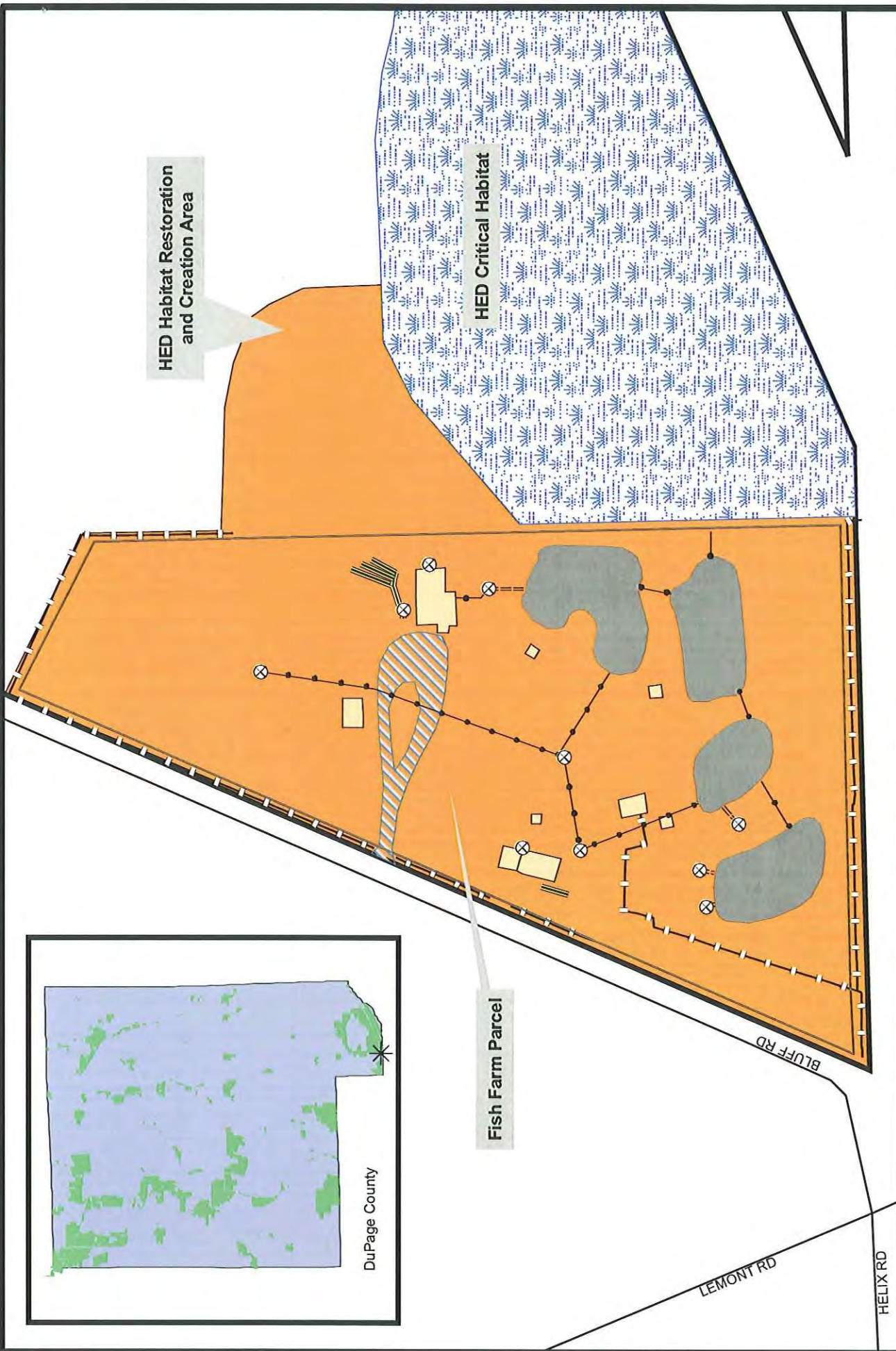
IN WITNESS WHEREOF, THE PARTIES HERE TO have executed this Safe Harbor Agreement to be in effect as of the date that the Service issues the Enhancement of Survival Permit (ESP) under ESA section 10(a)(1)(A).

  
\_\_\_\_\_  
~~Executive Director~~ President Date  
7/15/08  
Forest Preserve District of DuPage County

  
\_\_\_\_\_  
Field Supervisor Date  
7/10/08  
Chicago Ecological Services Field Office  
U.S. Fish and Wildlife Service

  
\_\_\_\_\_  
Brent Manning Date  
Executive Director  
Forest Preserve District of DuPage County





HED Habitat Restoration and Creation Area

HED Critical Habitat

Fish Farm Parcel

0 40 80 100 160 240 320 Feet

Drawn By: Tom Veit

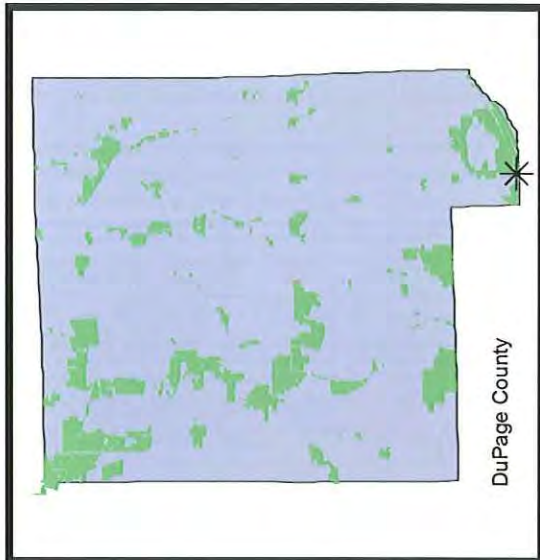
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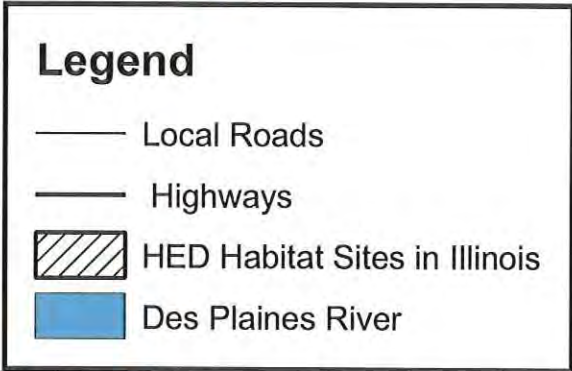
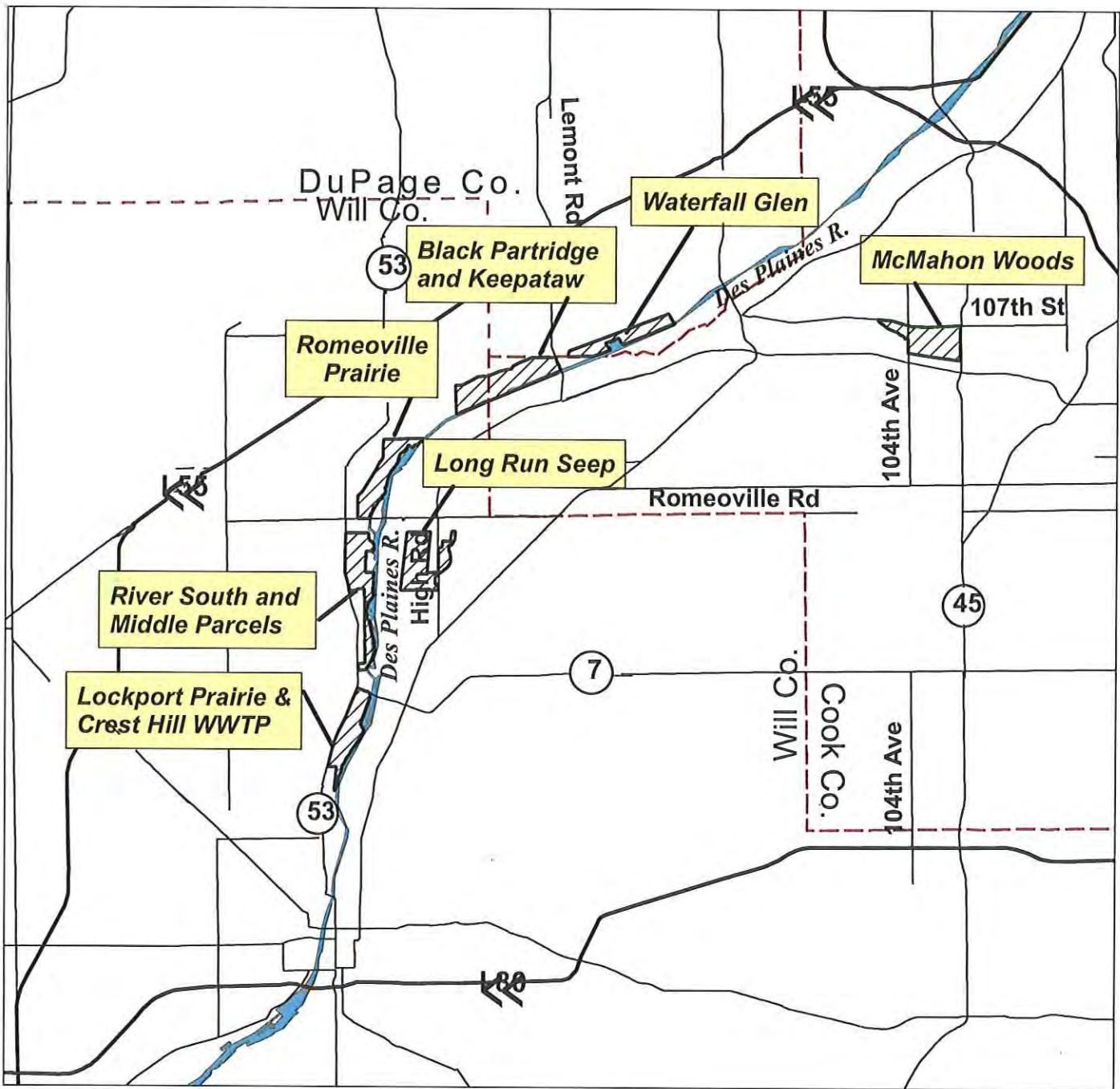
- ==== Above ground
- ==== Septic
- Underground
- Fences
- Road/Parking Lot
- Water
- Roads
- Buildings
- Enrolled Lands
- Preserve Boundary
- Artesian Well
- Fish Farm Parcel



**FIGURE 1: ENROLLED LANDS**  
**Fish Farm Parcel and Adjacent**  
**Land for Safe Harbor Agreement**  
**Waterfall Glen, DuPage County, Illinois.**







**Figure 2. Ten Hine's Emerald Dragonfly Habitat Locations in Illinois.**