

FINAL DRAFT 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 conservation and 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.

Purpose

The purpose of this SHA is to facilitate management actions that results in an increased population of HED on land and water within Waterfall Glen Forest Preserve in DuPage County, Illinois. Specifically, this refers to management actions proposed for the fish farm parcel and adjoining land within said preserve that is owned and managed by the District, a local public agency (See Figure 1 and see Section IV Description of Enrolled Lands).

The SHA serves as the basis for the Service to issue an Enhancement of Survival Permit (ESP) under ESA section 10(a)(1)(A) for the “take” of listed species associated with the future return of the property owners enrolled land to baseline conditions. The SHA implements the Service’s Safe Harbor Agreement final policy (FR 64:32717) and final regulations (FR 64:32706) as revised (FR 69:24084), in accordance with the procedural and substantive requirements of section 10(a)(1)(A) of the ESA.

Definitions

Unless otherwise provided in this SHA, terms used herein shall have the meaning given them under the relevant regulations promulgated by the Service as in effect on the effective date of this SHA.

II. COVERED SPECIES

Hine’s emerald dragonfly (*Somatochlora hineana*)

III. BACKGROUND

About Safe Harbor

Much of our Nation's current and potential habitat for listed, proposed, and candidate species exists on non-Federal lands, owned by private citizens, States, municipalities, Native American Tribal governments, and other non-Federal entities. Conservation efforts on non-Federal lands are critical to the long-term conservation of many declining species. More importantly, a collaborative stewardship approach is critical for the success of such an initiative. Many property owners are willing to voluntarily manage their lands to benefit fish, wildlife, and plants, especially those that are declining. Such voluntary management actions are not required by the Endangered Species Act (Act). Thus, failure to conduct such management would not violate any of Acts provisions. Beneficial management could include actions to maintain habitat or improve habitat (e.g., restoring fire by prescribed burning, restoring properly functioning hydrological conditions). Property owners are particularly concerned about possible future uncertainty relative to land-use restrictions that may result if listed species colonize their lands or increase in numbers or distribution because of the property owners' 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 (IDNR). It is also known to support adult and larval HED. There is also a parcel of land adjacent to Long Run Seep owned by HMS where adult HED have been observed. Finally, the newest discovery in Illinois is a very small degraded site between the Crest Hill Wastewater Treatment plant and the Des Plaines River. Both adults and larvae

have been documented there. These 10 sites are thought to constitute the Illinois population, which may function as a metapopulation. Lockport Prairie and River South are thought to support the largest subpopulations in Illinois.

Remaining sites in the southern recovery unit are located in Missouri and were not known until after publication of the Recovery Plan.

Species Description and Life History of HED

The HED is a moderately large species, with a wingspan of 90-95 mm (3.5 to 3.7 inches) and a body length of 60-65 mm (2.3 to 2.5 inches). The body is dark brown to dark metallic green, with a pair of yellow lateral stripes on each side. The eyes are bright green, though brown for the first day or two in teneral (newly emerged) adult individuals. The wings are clear and without large or obvious markings (Vogt and Cashatt 1994, USFWS 2001).

Larvae are aquatic nymphs that are light to dark brown in color and in their final instar or size class they range in total length (excluding antennae) from 23-25 mm. They are typically densely covered in setae, giving them a “hairy” appearance. A very detailed description of the larvae, with taxonomic keys, is provided in Cashatt and Vogt (2001).

The life cycle of the HED is similar to most dragonflies consisting of the following stages: aquatic egg, aquatic larva, and a terrestrial/aerial adult (Corbet 1962, USFWS 2001). 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, 1998). It is a relatively long-lived species, requiring 3-5 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 and all that is remaining is a dry streambed.

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. All crayfish collected in the burrow samples, along with any found walking the rivulets were positively identified as the devil crayfish (*Cambarus diogenes*) (Soluk *et al.* 1999).

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

(Soluk *et al.* 1999). Females lay their eggs in the spring, release their young in open water, and then return to the burrows (Soluk *et al.* 1999). The young-of-the-year remain in open water for part of the summer but begin burrowing as early as midsummer. If the crayfish moves out of its burrow to breed in late summer when droughts have been experienced in the HED habitat in Illinois, then it is possible that their burrows are unoccupied at the time when the HED would use them as refuge. The dragonfly larvae may be able to move into the crayfish burrow and position themselves in a potentially undetectable spot, while the resident crayfish is not present (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.

Preliminary analyses of fecal pellets from HED larvae indicate this species feeds on oligochaetes and larval mayflies and caddisflies, which are common in its habitat (Soluk *et al.* 1998, USFWS 2001).

Larval Habitat

The HED larvae live in wetlands dominated by graminoid (grass-like) plants and fed in part by groundwater. Two characteristics that are common to wetlands inhabited by the HED, appear to be shallow groundwater flowing slowly through vegetation, and underlying dolomitic limestone bedrock or cobble and weathered bedrock. The flowing water can range from barely detectable sheet flow through vegetation or a small well-defined streamlet or rivulet channel (USFWS 2001). All known sites in Illinois are wetland complexes consisting of several natural communities such as marsh, sedge meadow, dolomite prairie, spring, seep, and pond (Mierzwa *et al.* 1995a, Cashatt and Vogt 1996, Soluk *et al.* 1996, 1998, Steffens 1997, 1998, USFWS 2001).

Nuzzo (1995) and Mierzwa *et al.* (1998) sampled the structure and floral composition of the HED larval and adult foraging habitats at Lockport Prairie Nature Preserve, and HMS's River South and Middle Parcels, in Will County, Illinois. From these studies, it appears that the presence of water, emergent vegetation, and percent of exposed surface water are essential components of the larval habitat, and that the type of emergent vegetation may not be as important. Soluk has attempted to further define the larval habitat parameters with measurements of water temperature, flow rates, depth, width of streamlet, density of crayfish burrows, and other features (Soluk *et al.* 1999, Soluk and Moss 2003, Soluk 2004a) but those results have not yet been analyzed and interpreted quantitatively.

It also appears that drought, or periodic drying of the larval habitat on a seasonal basis may be an important element of the habitat. It may serve to exclude other competitors and predators that are not as drought resistant as the HED larvae (Soluk *et al.* 1999). However, it is not clear how the HED would be affected by longer term and/or more severe droughts such as that experienced in Illinois in 2005.

At Keepataw Preserve, it has been observed that areas that are primarily cold groundwater do not provide suitable larval habitat, while areas where the groundwater has mixed to some degree with warmer surface water provide more suitable larval habitat (D. Soluk, University of South Dakota, pers. comm. 2005).

Adults

Adults emerge in the summer months, as early as late May in Illinois and late June in Wisconsin, and continue to emerge through the summer (Vogt and Cashatt 1994, Soluk *et 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 can live at least 14 days (Soluk *et al.* 1996) and may live 4 to 6 weeks (Mierzwa *et al.* 1995, 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).

HED adults have been documented as traveling 5.4 km between sites (Lockport Prairie, River South, Middle Parcel) which have intervening roadways, bridges, buildings, railroads and industrial yards (Mierzwa 1995b). 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.

Although natural conditions would have been continuous in the lower Des Plaines River Valley at one time, not all of the area would have been 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 foraging is not possible. Breeding sites have probably always been distributed in patches and depend on the presence of suitable hydrology, substrate, and vegetation (Nuzzo, 1995). Thus, the HED is adapted to seeking out appropriate areas within a mosaic of optimal, suitable, and unsuitable habitat.

Breeding

Copulating pairs have been observed from early June to late August in Illinois (USFWS 2001, Vogt and Cashatt 1994, Vogt and Cashatt 1997). Males have been observed intercepting females within their territory, flying off in tandem, and copulating while perched in shrubs. Females have also been observed flying over to males, which resulted in copulation (Soluk *et al.* 1996). Females oviposit into shallow water found in rivulets or shallow channels within marsh or sedge meadow or into soft mud. Females dip their abdomens into the water or mud up to 200 times (Vogt and Cashatt 1994, USFWS 2001, Vogt and Cashatt 1997) though they may not be depositing eggs with each dip (Soluk pers. comm.). Females may deposit more than 500 eggs in shallow water or soft mud. It is thought that the eggs overwinter and hatch in the spring (Soluk and Satyshur 2005). There is some evidence that the females utilize upland habitat during non-breeding times to avoid interactions with males (Soluk 2005, Foster 2001).

Swarming

Many dragonfly species are known to exhibit swarming behavior as adults. Little is known about swarming behavior in dragonflies, though it is thought to be associated with concentrations of prey (Zuehls 2003). A study conducted at the Door County, Wisconsin HED sites documented HED in swarms of mixed species aggregations composed of dragonflies within the families Corduliidae, Aeshnidae, and Libellulidae. The HED was the most abundant species found within these swarms, which contained 16 to 275 individual dragonflies (Zuehls 2003). Females were the predominant sex and some swarms were observed to be exclusively female. Peak swarm activity was 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 (Zuehls 2003).

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

Feeding flights have been observed in both females and males over meadows, old fields, and narrow roads (Vogt and Cashatt 1994). The crepuscular feeding swarms discussed above also seem to be a major feeding behavior (Vogt and Cashatt 1994, Zuehls 2003). Adults feed on small dipterans and other small insects. 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).

Threats to the Species

The principle threat to the species in Illinois is habitat degradation/alteration. Developing commercial and residential areas, quarrying, landfills, construction of pipelines, roadways, and filling of wetlands could decrease the area of suitable habitat available to the species and fragment populations (USFWS 2001). Changes in surface and sub-surface hydrology could be detrimental to the HED. Alteration of hydrologic regimes could adversely affect the larval and breeding habitat of the species by changing water temperature, flow, chemistry, and volume. Road construction, municipal and private wells, addition of impervious surfaces, and alteration of surface drainage patterns could all cause reductions in the suitability of habitat or the outright loss of suitable larval and breeding habitat.

Changes in groundwater quality and quantity from various development related activities are a major cause of habitat degradation and loss in Illinois. A study to predict hydrologic changes to a spring near Black Partridge Creek caused by the construction of I-355 predicted an 8 to 35% loss in spring discharge from the spring (Hensel *et al.* 1992, USFWS 2001). Soluk (2004a) has suggested that a reduction in groundwater flows to the rivulets and seeps at Lockport Prairie may have contributed to the decline in larval numbers observed there. Due to this ongoing concern regarding the hydrology at Lockport Prairie, Graef, Anhalt, Schloemer & Associates (GASAI) has conducted investigations of the surface hydrology and hydrogeology of the preserve (GASAI 2004a, 2004b). A land use analysis for the estimated recharge area for Lockport Prairie has also been completed to aid agencies in identifying potential threats to the groundwater (GASAI 2005a). More recently, an estimate has also been made of the recharge area for HMS's River South parcel (GASAI 2005b). The identification of these recharge areas is critical to efforts to maintain adequate groundwater hydrology at HED habitat. The other HED sites in Illinois are also fed by groundwater aquifers that have not been defined or estimated, however, they have not had any noted drying of the habitat other than that anticipated given natural drought conditions in 2005.

Mining is also a threat to this species. Two of the sites in Illinois are owned by an aggregate mining company (HMS) and the smaller of those sites (Middle Parcel) has been proposed for mining the dolomite bedrock. This would result in a direct loss of 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. It is not known if contamination/water quality degradation has been a contributing factor in the decline of larval numbers at Lockport Prairie, 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 collisions with vehicles or trains has been documented and may reduce HED population sizes (Steffens 1997, 1998, Soluk *et al.* 1998, 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 three 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.

Certain land use practices, fire suppression, and agricultural development have reduced available habitat as well as reduced the abundance of insects for prey across its range. Ongoing research and monitoring is helping to enhance the understanding of habitat use and characteristics. These threats to the species affect one of the two known populations in the southern recovery unit.

IV. DESCRIPTION OF ENROLLED LAND

Enrolled land for the purpose of this SHA are the fish farm parcel and immediately adjoining land on the southwestern portion of Waterfall Glen Forest Preserve in DuPage County (see Figure 1). The fish farm parcel itself consists of mowed turf grass, several buildings, a gravel driveway, several picnic shelters, septic systems, and a series of fish ponds that are groundwater fed via a system of pipes and artesian wells. This parcel was purchased by the District as a 12-acre addition to the larger Waterfall Glen Forest Preserve (2,721 acres). The current use of the parcel is a License Agreement between the District and the University of South Dakota in the form of housing and laboratory / storage space for HED researchers. This agreement is valid for two years (start June 2007) with an option for annual renewal. After the License Agreement is dissolved, it is the intention of the District to implement one, none, or a combination of the following resource compatible uses: 1) fully restore this parcel to a naturalized state consistent with the adjacent landscape within the preserve; 2) create naturalized conditions on portions of this parcel; and / or 3) develop a resource compatible public use on the parcel for the education and enrichment of the citizens of DuPage County. The potential uses of this property, as stated above, are consistent with the District's responsibility to acquire and hold land to preserve and protect natural resources relative to the Downstate Forest Preserve Act, 70 ILCS 805/0.001 et seq. (West 2006).

This SHA will cover all actions to manage for the benefit of the HED within the fish farm parcel and immediately adjoining land (i.e., enrolled land) within the Waterfall Glen Forest Preserve.

V. BASELINE DETERMINATION

The baseline condition (determination) for the proposed enrolled land is zero. There currently no larval or breeding HED habitat on any enrolled land.

The fish farm parcel and adjoining land (see Figure 1) are considered a highly developed landscape with artificial ponds, drainage structures and wells, buildings, driveways, and mowed turf grass. Adults occasionally fly over the area for foraging or roosting. These adults would be coming from the adjacent marsh, known as Emerald Fen. This marshy area is a known breeding site with occupied larval habitat. In 2006, 5 observation stations were established within the fish farm parcel, with 2 additional stations in the adjacent marsh. The results included 3 positive observations of HED adult males at the fish farm station, with additional observations of HED adult males over the adjacent marsh. No females were observed.

The activities proposed under this SHA, and potential future restoration and resource compatible development efforts at the fish farm, are not actions that would potentially cause any take of adult HED.

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 (See Section 12.3).
- 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 District property by third party contractors regardless of funding source.

U.S. FISH AND WILDLIFE SERVICE CHICAGO FIELD OFFICE:

- 1) Provide a qualified biologist(s) for coordinated implementation of the biological and compliance monitoring as needed on an annual basis. Compliance monitoring is verifying that the permittee is carrying out the terms and conditions of the ESP.
- 2) If warranted, recommend procedures/actions that may be implemented to avoid future take based on any take which occurred as described in past annual reports.

VII. NOTIFICATION REQUIREMENTS

Annual Report

The District will make available and provide the following information to the Service in an annual report due January 31st of the year following each year of this agreement:

- 1) A narrative describing the management actions and/or conservation measures performed and the amount of habitat potentially enhanced or restored.
- 2) A summary of the location(s) and circumstance(s) where incidental take of HED was anticipated or documented, the amount of habitat returned to baseline, and when the take occurred.
- 3) A narrative explanation and results of all compliance monitoring activities for the property.
- 4) A narrative explanation and copies of any biological monitoring for the property.
- 5) A summary of any actions of non-compliance with this SHA, and the measures employed to remediate the non-compliance.

VIII. MANAGEMENT ACTIVITIES FOR COVERED SPECIES

Management Objectives

Resource management objectives for this SHA include: 1) creation of rivulet systems which can be used to experimentally manipulate flow rate, temperature, and degree of permanence; 2) restoration of habitat along each rivulet which mimics the structure and function of known breeding habitat; and 3) monitoring of larval HED recruitment and survival rates.

Activities

The following management activities will guide implementation of this SHA. Site-specific measures will be detailed in the final site plan, which will be reviewed and approved by the Service and the District prior to implementation.

- Repair or cap artesian wells to increase water availability.
- Construct a temporary piping system to bring artesian groundwater to a habitat creation site.
- Construct swales or rivulets similar to existing HED habitat to facilitate habitat creation.
- Establish native vegetation around habitat creation areas.
- 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 through established means, such as 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 to buffer and protect HED habitat.

The above actions would 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.

A detailed hydrogeologic characterization study will be completed and the results used to inform the habitat restoration/creation effort. The restoration/creation design may also be influenced by the HED working group (HEDWG), established by the Illinois State Toll Highway Authority (ISTHA).

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 ESP. As such, this SHA and associated ESP will authorize the Service, after reasonable prior notice to the District, the right to enter enrolled lands for the purpose of conducting annual site visits to ensure compliance with the terms and conditions of the ESP.

The District will continue to support biological monitoring of both adult and larval HED on the Waterfall Glen Forest Preserve property. Monitoring will be conducted to determine, among other things, HED presence/absence, population estimates, and spatial distribution of both adult and larval HED before, during and after restoration efforts. All monitoring results will be reported annually to the Service and the District.

An evaluation of the SHA will be completed every fifth year to ensure that the purpose of the SHA is meeting conservation and recovery objectives of the HED.

Adaptive Management

Adaptive Management allows for mutually agreed-upon changes to the SHA's conservation measures in response to changing conditions or new information. If the expected results of the conservation measures appear ineffective, management activities can be changed or alternative activities undertaken to achieve desired results. Decisions related to adaptive management will be based on an evaluation of

compliance and biological monitoring results detailed in the annual reports, and of field observations by the Parties. Adaptive management decisions may be made at any time as deemed necessary and mutually agreed upon by the Parties.

IX. RETURN TO BASELINE

For this SHA, “return to baseline conditions” means returning the HED population back to the baseline established at the issuance of ESP. The Permittee reserves the right to take their enrolled land back to baseline conditions at the end of the agreed-upon timeframe. The Safe Harbor program allows for early termination of SHA under certain circumstances. Therefore, the SHA can be terminated by the parties prior to the expiration date, and they can return the land to baseline conditions even if the expected ‘net conservation benefits’ have not been realized. However, the Service requests reasonable advance written notice of 60 days minimum for the opportunity to relocate affected, listed species, if possible.

X. NET CONSERVATION BENEFIT

The intent of this SHA is to aid in the recovery of HED. The SHA will facilitate management actions on enrolled lands that result in an increased population of HED. For as long as management activities are carried out on enrolled lands, or the habitat they create persists, enrolled lands will benefit the conservation and recovery of HED. Without this SHA, enrolled properties are unlikely to support HED in the foreseeable future.

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 ESP, as appropriate, to address the presence of additional listed species on enrolled lands.

Assurances in the ESP will not be extended to non-covered species not included in the SHA, or if their presence are a result of activities not directly attributable to the District. In these cases, enhancement or maintenance actions that are specific to the non-covered species must be developed, and baseline conditions determined. Any substantial change to the SHA, or revision to the ESP because of non-covered species, would be subject to the same review process (*i.e.*, section 7 of ESA and public review) as the original SHA.

Transfer of Ownership

This SHA commits the District to notify the Service if and when any land subject to this SHA is transferred to another party. This will allow the Service to contact the new property owner to explain the SHA, and determine whether the new property owner would like to continue the original SHA or enter into a new SHA. When a new property owner continues with the existing SHA, the Service will honor the baseline conditions for the enrolled property under consideration.

In the event that the District transfers ownership of any of the enrolled property, the Service will regard the new owner as having the same rights and obligations as the original property owner, if the new property owner agrees to become party to the SHA. Actions taken by the new property owner that result in incidental take of species covered by the SHA would only be authorized if the new property owner maintains baseline conditions and agrees to become party to the SHA. The new property owner however would neither incur responsibilities under the SHA or receive assurances unless the property owner becomes party to the SHA.

XII. AGREEMENT DURATION

The Service's Safe Harbor Policy states that the length of a SHA must be of sufficient duration to "reasonably allow enough time to achieve the expected net conservation benefit for the listed species". This SHA will become effective upon issuance of the Section 10(a)1(A) ESP and will remain in effect for 15 years.

XIII. FUNDING

Implementation of this SHA is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this SHA will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury or from the District. The Parties acknowledge that the FWS will not be required under this SHA to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

It is acknowledged that the restoration efforts encompassed in this SHA between the Parties, will likely be funded by a third party, namely ISTHA. ISTHA funding that may be provided for this restoration effort is a part of their obligation for beneficial actions described in the October 31, 2005 Biological Opinion for the South Extension of I-355. However, accepting and allowing ISTHA to perform these restoration actions on District land is entirely voluntary by the District. It is the intent of the District to fully restore the subject property regardless of ISTHA funding and participation, though alternate funding is neither currently available nor obligated by the District.

XIV. MODIFICATIONS

Modification of the SHA

Either Party may propose modifications or amendments to this SHA, as provided in 50 CFR 13.23, by providing written notice to, and obtaining the written concurrence of, the other Party, if such modifications do not change the determination that this SHA will provide a net conservation benefit to HED. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. The Parties will use 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, the District ceases to be able to continue to administer this SHA, and no other entity satisfactory to the Service is willing to assume the District's responsibilities, the District will relinquish its ESP to the Service.

Permit Suspension or Revocation

The Service may suspend or revoke the ESP 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 ESP.

Remedies

Each Party shall have all remedies otherwise available to enforce the terms of the SHA and the ESP, 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.

Dispute Resolution

Both District and the Service agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all Parties.

XV. ADDITIONAL MEASURES

No Third Party Beneficiaries

This SHA does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not party to this SHA to maintain a suit for personal injuries or damages pursuant to the provision of this SHA. The duties, obligations, and responsibilities of the Parties to this SHA with respect to third parties shall remain as imposed under existing law.

Notices and Reports

Any notices and reports, including monitoring and annual reports required by this SHA shall be delivered to the persons listed below, as appropriate:

Field Supervisor, U.S. Fish and Wildlife Service, Chicago Illinois Field Office

Executive Director, Forest Preserve District of DuPage County

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