

Species Status Assessment

Common Name: Ocellated emerald **Date Updated:** December 19, 2023

Scientific Name: *Somatochlora minor* **Updated By:** Erin L. White

Class: Insecta

Family: Corduliidae

Species Synopsis (a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):

The Midwest Canadian Shield forest ecoregion in Northwestern Ontario forms the center of distribution for the ocellated emerald (*Somatochlora minor*), whose full range extends from the Yukon, south to Colorado and northeast to Newfoundland and Labrador. New York lies along the southeastern extent of that range. Records from the Adirondacks are some of the southernmost known occurrences in the northeast (Donnelly 2004b).

In New York, the most thorough habitat description comes from a site in St. Lawrence County where *S. minor* was found in a wetland small stream (5-8' wide) with a mud and muck bottom. At least one small beaver dam is present on the site and one end of the bog appears to have been impounded in previous years, with scattered dead spruce and a marshy portion at the far end. Another end of the wetland is more typical of a bog with stunted black spruce, tamarack, ericaceous shrubs, sedges, cranberries, and areas of standing water and rivulets. The spruce grades into dense 10-30 foot-tall black spruce and tamarack. The remaining extant locales in New York were from streams in, or near, similar bog habitats (White et al. 2010). Ross (2001), however, described very different occupied sites in Michigan, and eastern vs. western North American populations appear to have alternative habitat preferences (Walker and Corbet 1975, Dunkle 2000, Cannings and Cannings 1994).

I. Status

a. Current legal protected Status

i. **Federal:** Not Listed **Candidate:** No

ii. **New York:** Not Listed

b. Natural Heritage Program

i. **Global:** G5

ii. **New York:** S1S3 **Tracked by NYNHP?:**

Other Ranks:

-NYS 2025 SGCN Status: Species of Greatest Conservation Need

-IUCN Red List: Least Concern

-Northeast Regional Rank (White et al.2015): R2, shared responsibility

Status Discussion:

White *et al.* (2010) calculated a revised draft S-rank of S1S3 from S2S3. This rank should be revisited as it can likely be revised to an S2S3 with current information.

II. Abundance and Distribution Trends

| Region | Present? | Abundance | Distribution | Time Frame | Listing status | SGCN? |
|------------------------|----------|-----------|--------------|--------------------------------------|----------------|-------|
| North America | Yes | Unknown | Unknown | Last assessment US 1985; Canada 2012 | | - |
| Northeastern US | Yes | Unknown | Declining | | R2 | No |
| New York | Yes | - | - | Pre and post 2005 | S2S3; SPCN | |
| Connecticut | Yes | Unknown | Unknown | | | No |
| Massachusetts | No | - | - | | | - |
| New Jersey | No | - | - | | | - |
| Pennsylvania | No | - | - | | | - |
| Vermont | Yes | Unknown | Unknown | | S2 | No |
| Ontario | Yes | Unknown | Unknown | | S4 | - |
| Quebec | Yes | Unknown | Unknown | | S5 | - |

Column options

Present?: Yes; No; Unknown; No data; (blank) or Choose an Item

Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

The New York State Dragonfly and Damselfly Survey (NYSDDS) was conducted from 2005-2009 but there are no organized, regular monitoring or survey activities directed toward this species or to sites where it has been documented other than the Duane Stream site at Titusville SF every five years.

Trends Discussion *(insert map of North American/regional distribution and status):*

Prior to the 1990s this species was known for New York from a single vague museum record near Harrietstown in Franklin County in 1922 (Donnelly 1999). Several records were obtained in the 1990s and additional records during the NYDDS from 2005-2009. Similar increases in records for this species were noted during the Maine and New Hampshire Dragonfly surveys (Brunelle and deMaynadier 2005, Hunt 2012). While there is some possibility that this increase in records is the result of range expansion, and therefore an increasing population trend, it is far more likely that these records are the result of increased numbers of observers looking for dragonflies, and looking for species at bog sites suitable for this species. As such, comparative survey effort in future years will be needed to establish trend information (P. Novak, pers. comm.).

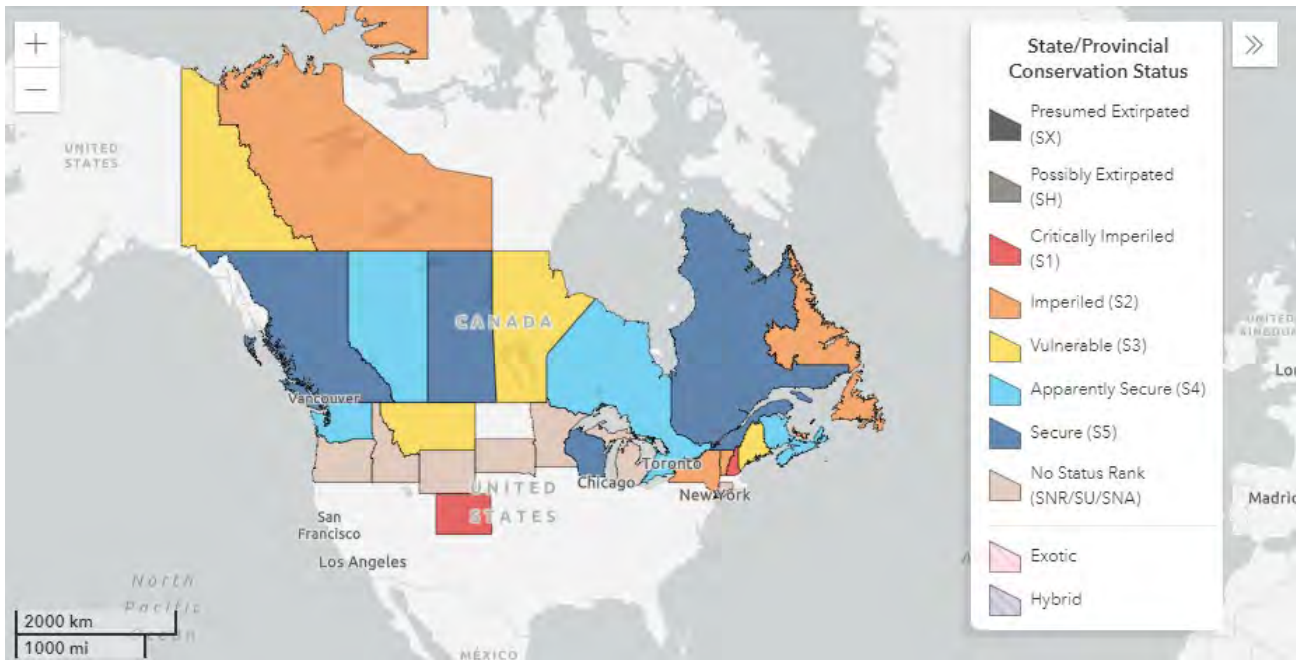


Figure 1. Conservation status of the Ocellated Emerald in North America (NatureServe 2023).

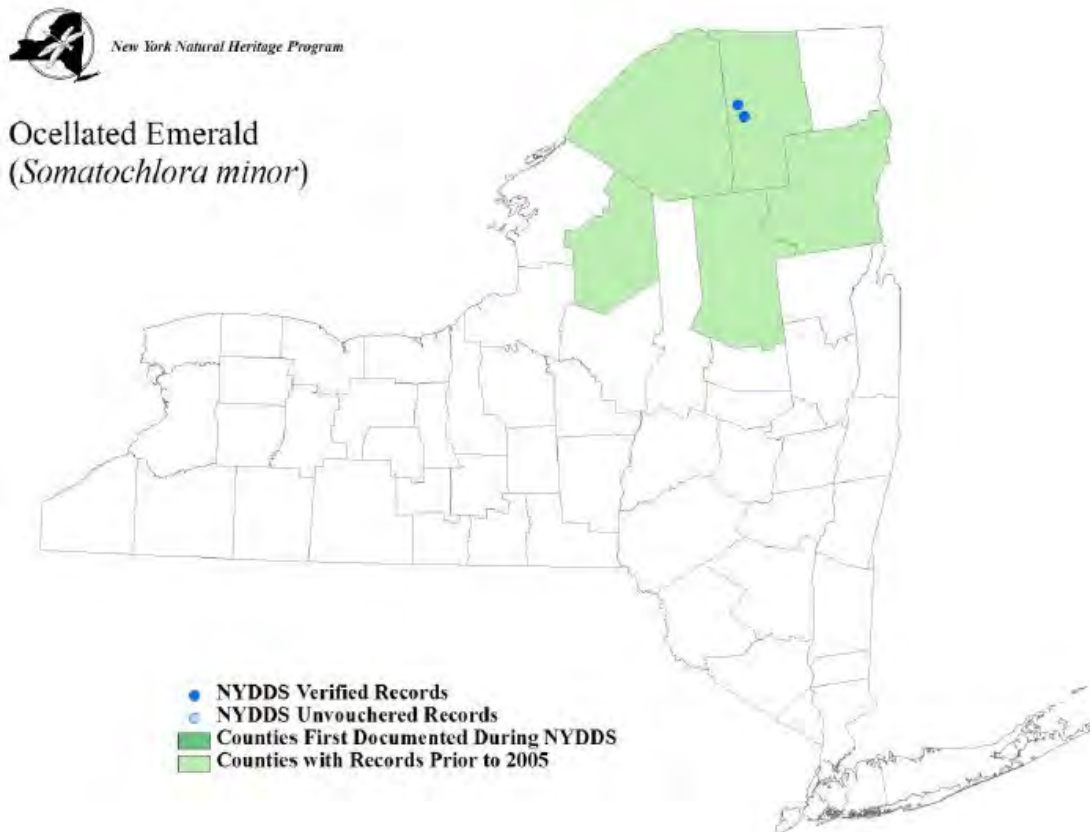


Figure 2. Occurrence record of the ocellated emerald in New York during the NYDDS (White *et al.* 2010).

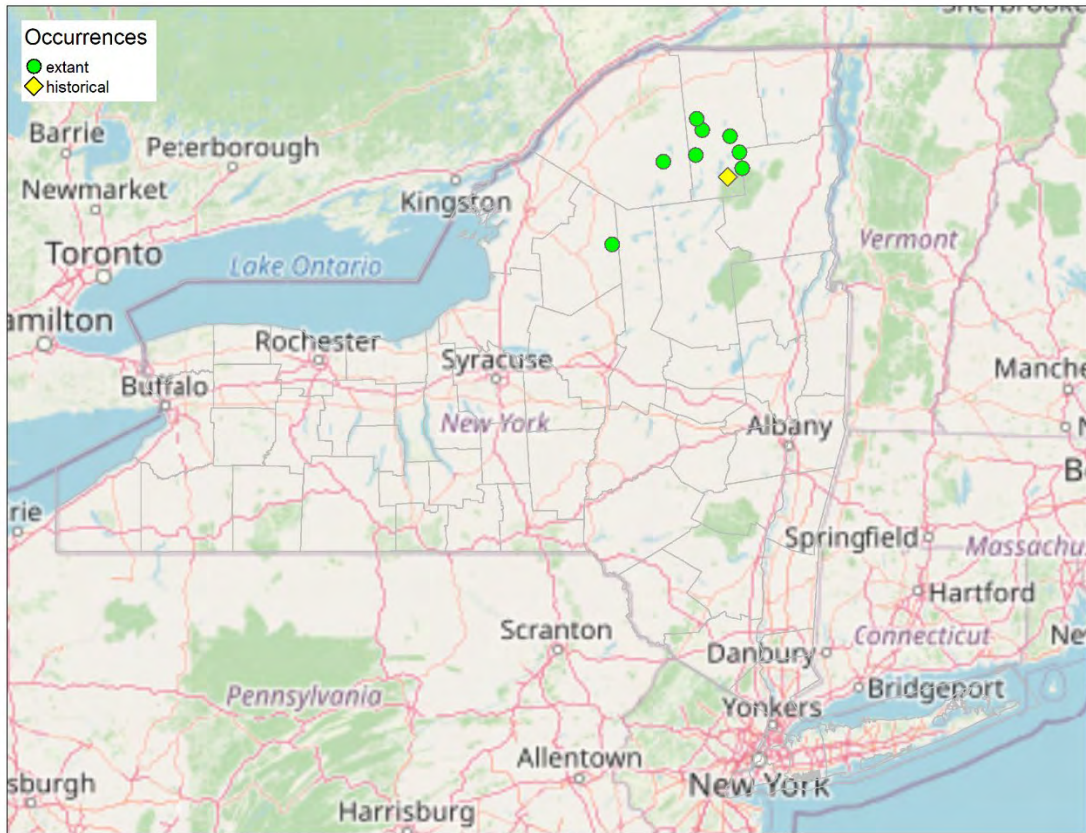


Figure 3. NYNHP element occurrence records for the oscellated emerald in New York (NYNHP 2023a).

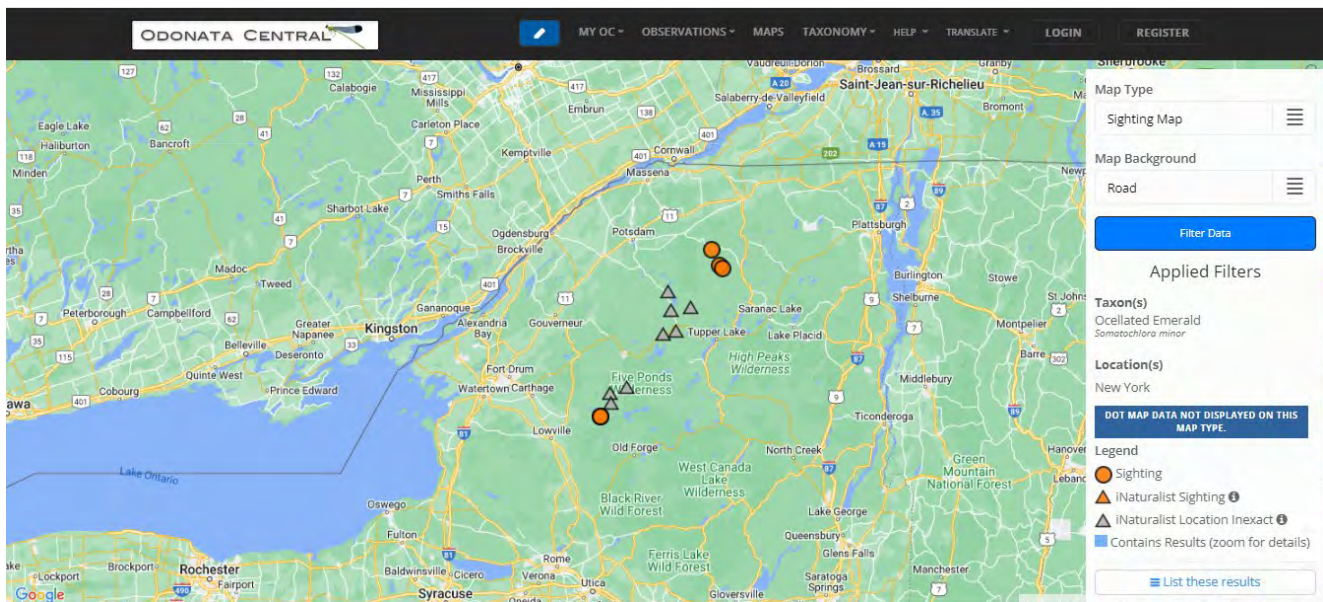


Figure 4. Distribution of the oscellated emerald in New York (Abbott 2023).

III. New York Rarity (provide map, numbers, and percent of state occupied)

This pattern of increased data could be indicative of either a recent range expansion, or simply increased survey efforts, most likely the latter. Similarly, the number of known townships inhabited by this species in Maine more than tripled to over 40 during atlas efforts in the state (Brunelle and deMaynadier 2005) and the species was recorded from several new townships during the New Hampshire Dragonfly Survey (Hunt 2012).

| Years | # of Records | # of Counties | % of State |
|-----------|--------------|---------------|------------|
| Pre-2005 | 5 | 4 | 1-5% |
| 2005-2009 | 2 | 1 | <1% |
| 2010-2023 | 6 | 4 | 1-7% |

Table 1. Records of ocellated emerald in New York.

Details of historic and current occurrence:

Prior to 1990, this species was known from New York from a single vague museum record near Harrietstown, Franklin County, possibly Bloomingdale Bog, in 1922 (Donnelly 1999).

There are records from the early to mid-1990s from Franklin County at Bloomingdale Bog, Spring Pond Bog, and from St. Lawrence County at the Oswegatchie (Donnelly 1999). The range was extended further south in the early 2000s when records were reported for Lewis and Hamilton Counties (Donnelly 2004a), and another at Leonard Pond Bog near Sevey Corners in St. Lawrence County (NYNHP 2023). During the NYDDS, *S. minor* was found near bog streams along Blue Mountain Road in Franklin County (White *et al.* 2010). Since 2016 to present, it has been documented in Franklin County on the Osgood River, St. Lawrence County at Leonard Pond Bog, Massawepie Mire, and Brandy Brook, Essex County at Oseetah Lake Bog, and Lewis County at Burnt Creek (iNaturalist 2023, NYNHP 2023). While other *Somatochlora* species remain present at Bloomingdale Bog and Spring Pond Bog, it has not been documented recently in these locations.

If it occurs in 4/62 counties, that is very roughly about 6.5% of the state, though the occupied area of those counties is rather small. There are likely additional undocumented populations in northern NY and the % of the state can be estimated to be <1-7% currently.

New York’s Contribution to Species North American Range:

| Percent of North American Range in NY | Classification of NY Range | Distance to core population, if not in NY |
|---------------------------------------|----------------------------|---|
| 1-25% | Peripheral | ~960 mi |

Column options

Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type (from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):

Small streams that run through open acidic peatlands, wet meadow/shrub swamp, mixed hardwood swamp and northern white cedar swamp

- a. Size/Waterbody Type:** Headwater creeks
- b. Geology:** moderately buffered to low buffered, acidic
- c. Temperature:** Transitional Cool to Cold
- d. Gradient:** Very low to moderate-high

Habitat or Community Type Trend in New York

| Habitat Specialist? | Indicator Species? | Habitat/Community Trend | Time frame of Decline/Increase |
|---------------------|--------------------|-------------------------|--|
| Yes | Yes | Declining | Declining long-term, stable short-term |

Column options

Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item

Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

S. minor prefers clear, small to medium, flowing forest streams without emergent vegetation, especially stream pools and areas where streams leave the forest and open into meadows (Dunkle 2000, Paulson 2011). In the Northeast, virtually all known sites are associated with wetland habitats (NYNHP 2023, Olivero and Anderson 2008, Gawler 2008).

V. Species Demographic, and Life History:

| Breeder in NY? | Non-breeder in NY? | Migratory Only? | Summer Resident? | Winter Resident? | Anadromous/Catadromous? |
|----------------|--------------------|-----------------|------------------|------------------|-------------------------|
| Yes | - | - | Yes | Yes | - |

Column options

First 5 fields: Yes; No; Unknown; (blank) or Choose an item

Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion (include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):

“*S. minor* feed while flying 6 feet up in shady forest glades or along forest edges. They often perch on grasses, sedges, or rocks and tree trunks near the stream after lengthy flying bouts. Foraging flight is relatively low, usually below head height in woodland clearings, sometimes a bit higher with high-flying larger emeralds. Patrolling males fly smoothly and rapidly forward a few yards, then hover for up to 30 seconds. They are late-day flyers, often until 7:30 pm. Some females oviposit by alternating taps on the water surface near the shore and the wet, mossy bank above, then move to another location to repeat the process. During this process, eggs are commonly tapped to moss above the waterline once for each 2-3 taps to the water. Other individuals simply tap the surface of shallow flowing water” (Paulson 2011, Dunkle 2000).

“Boreal *Somatochlora* nymphs occupy shallow wet meadows, sedge-filled pools, and sedge-filled shadows of small ponds during the 4 years that they require to develop. During this stage, they are drought resistant and can withstand dry conditions through physiological adaptations and by burrowing in mud and seeking out sheltered locations in moss, cracks in mud, crevices in rotting logs, and sedge root clumps” (Wiley and Eiler 1972).

Donnelly (1999) reported the flight season for New York as June 12 to August 5, similar to the mid-June to mid-August season documented for Maine (Brunelle and deMaynadier 2005), but recent NY records from the the 1990s through 2022 were from a shorter time period; between June 27 to July 21 (White *et al.* 2010, iNaturalist 2023). This shorter time period likely represents the peak flight period for the species in the New York. The latest recent record in NY is from August 17 (NYNHP 2023).

VI. Threats (from NY 2015 SWAP or newly described):

As with other small forest stream species, there is little published information citing specific cases of negative impacts to this species/habitat grouping, however, any activity that might lead to water contamination or the alteration of natural hydrology could impact *S. minor*. Such threats for this species which is confined to northern New York forested habitats might include changes in dissolved oxygen content, flow alteration, increases in sediment load, development near their habitats, and the building of dams (Novak 2006).

The ocellated emerald was classified as “not vulnerable/presumed stable” (PS) to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program. Available evidence does not suggest that abundance and/or range extent within the geographical area assessed with change (increase/decrease) substantially by 2050. Actual range boundaries may change (Schlesinger *et al.* 2011).

| Threats to NY Populations | |
|------------------------------------|--|
| Threat Category | Threat |
| 1. Climate Change & Severe Weather | Habitat Shifting & Alteration |
| 2. Climate Change & Severe Weather | Temperature Extremes |
| 3. Pollution | Industrial & Military Effluents (acid rain, mercury) |

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes:

No:

Unknown:

If yes, describe mechanism and whether adequate to protect species/habitat:

Article 15 of Environmental Conservation Law provides protection of rivers, streams, lakes and ponds through the Protection of Waters Program. The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Adirondack Park Agency has the authority to regulate smaller wetlands within the Adirondack Park.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Further surveys are needed for this species.

It is likely that this species occurs on small streams within larger bogs throughout the Adirondacks and perhaps the Tug Hill Plateau, especially since *Somatochlora* almost always occur at low densities, fly high (30-50'), and adults are very elusive (Packauskas 2005).

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2006) includes recommendations for the following actions for odonates of small forest streams, and for ocellated emerald in particular.

Habitat monitoring:

Support and encourage habitat monitoring efforts that would complete the baseline assessment of habitat quality and threats.

Habitat research:

Support and encourage research projects that will help define preferred habitat in order to guide future monitoring, restoration and habitat protection efforts.

New regulation:

Recommendations for official state endangered, threatened, and special concern listing are an anticipated result of the statewide inventory. It is expected that one or more of these species will be recommended for listing and officially adding these species to the list would constitute a specific action.

Population monitoring:

Conduct surveys to obtain repeatable, relative abundance estimates for these species at known sites and newly discovered sites where access permission to conduct surveys is obtained (as indicated in the State Wildlife Grant Odonate Inventory Project).

Further survey effort:

All three of these species are known from fewer than 10 locations in the state, but new populations undoubtedly remain to be discovered.

| Conservation Actions | |
|--------------------------|---------------------------------|
| Action Category | Action |
| 1. Land/Water Protection | Resource and habitat protection |

| | |
|----------------------------|---------------------------------------|
| 2. Land/Water Protection | Site/area protection |
| 3. Land/water management | Site/area management |
| 4. Land/water management | Habitat & natural process restoration |
| 5. Land/water management | Invasives/problematic species control |
| 3. Education and Awareness | Awareness & Communications |
| 3. Education and Awareness | Training |
| 4. Law and Policy | Policies and Regulations |

Table 3. Recommended conservation actions for ocellated emerald

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