

DELAWARE-OTSEGO AUDUBON SOC. FALL 2017 RAPTOR SURVEYS IN THE PROPOSED BLUESTONE WIND PROJECT

The Delaware-Otsego Audubon Society (DOAS) was awarded intervenor funding on October 16, 2017 through the NY State Department of Public Service Article 10 review process for the proposed Bluestone Wind project in the Towns of Sanford and Windsor in Broome Co., NY. Funding was granted for the analysis of GPS tracking data from Golden Eagles, and for on-the-ground surveys of raptors to be conducted during the fall and spring peaks of the Golden Eagle migration. Fall surveys were completed on November 27, 2017. This report covers the fall period. Spring surveys will be conducted in March 2018.

Prior to the intervenor funding hearing on 10/16, DOAS had scouted the project area for sites with an adequate viewshed for surveying migrating raptors, with limited success.

Within several days of the funding approval, DOAS received a draft fall migration map of Golden Eagle GPS tracks through the project area from Dr. Trish Miller. A final map was received following suggestions from DOAS (map attached). This map showed a cluster of tracks near Cliff Road in the Town of Sanford.

The site was investigated and found to have a limited view and to be on a public road. Despite the somewhat restricted view, it is as good quality as any other site found in the study area. It also appeared on a map produced by Bluestone Wind contractor Western Ecosystems Technology (WEST) that indicated a nearby location was used for their earlier surveys.

No site with an adequate view could be found near a smaller cluster of Golden Eagle tracks in the western part of the project area.

The Cliff Rd. site is on the edge of the project area. During consultation with the NY State Department of Environmental Conservation (NYSDEC), it was agreed that a site near the periphery with better visibility was preferable to a more central site with a poor view. In light of these considerations, this site was chosen by DOAS as its fall survey location.

Site coordinates are 18T 0454822 4651829 or 42° 1'1.89"N – 75°32'44.37"W

Between the approval of the funding request and the start of surveys, DOAS held separate conference calls with the US Fish and Wildlife Service (USFWS) and NYSDEC to discuss a draft protocol and determine what additional data those agencies desired in their review of the Bluestone Wind project. USFWS requested that distance and height information of eagles be recorded. Eagles would be recorded as above or below 200 meters (the approximate height of proposed wind turbines), and within or beyond 800 meters from the survey site. Using these categories USFWS can sort data and directly compare DOAS survey results to those results from surveys carried out by Bluestone Wind. As a result of this

discussion, data fields were added to the protocol for these height and distance categories for all species.

NYSDEC requested detailed data recording – including the mapping of flight paths - for the two eagle species and two additional at risk species - northern harrier and peregrine falcon. A “Listed Species” form was created using data gathered by Bluestone Wind in their surveys as a model, and also added to the protocol. At the conclusion of the surveys, these data were entered into a spreadsheet for analysis (attached).

Five qualified hawk counters from the Franklin Mountain Hawk Watch were recruited to cover the Cliff Rd. site. A schedule was created and a final protocol was distributed to the DOAS surveyors. In addition, conversations were held with surveyors to ensure they understood the protocol and the system for recording data.

SITE INFORMATION

A view of the horizon is important for surveying migrating eagles. Large soaring raptors, including Golden Eagles, frequently fly at low altitudes during migration, using lift from winds deflecting off hills and ridges to glide efficiently. An unobstructed view of the horizon is essential for thorough surveys. An obstructed horizon - even in part - can result in missed birds, or birds that are within view only briefly.

Advantages of the site:

- The site has as good or better a view as any other location scouted by DOAS. There is an approximate 75° unobstructed view of the distant horizon (beyond 800 meters) in a southeasterly direction. This view is of a ridge that is well oriented to the migration.
- The site is believed to be near the site of the fall 2017 surveys by WEST.
- 4 GPS tracked Golden Eagles had passed near the site during fall migrations.
- The site is on a public road, simplifying access.

Disadvantages of the site:

- About 210° of the distant horizon is seen through trees.
- Because of a hill, there is no view of the far horizon to the north. The view to the northeast is limited by trees and the slope of the same hill. Since most migrants would approach the site from the northeast during fall migration, the view of birds coming from that direction could be restricted.
- The hill to the north blocks the distant horizon over about 75° of the field of view. Observers can only see distant birds in that direction if they are more than 4° above the horizon. The top of the hill is about 530 meters distant and 37 meters above the site (includes the height of the mature trees). 800 meters from the site in that direction the elevation is approximately the same as the survey site. Thus the entire 1600 meter diameter X 200 meter high cylinder could not be completely surveyed. Low birds north

- of the adjacent hill would likely not be seen.
- After surveys started, three neighboring landowners expressed concerns about the safety of our surveyors on opening weekend of the deer rifle season. These landowners are quite familiar with the numbers and behavior of the hunters using the land surrounding the site. Having taken these concerns seriously, we chose to not survey on 18 and 19 November even though weather conditions were acceptable on the 19th.
 - The highest point on the dead end road is also the only place available to turn a vehicle around. To avoid possible conflicts with neighbors, we chose to use a site slightly lower than that high point. During our surveys we observed Bluestone Wind surveyors using the highest point on the road.

WEATHER AND TIMING OF THE 2017 FALL MIGRATION

Weather factors delayed completion of the surveys until 11/27, two days beyond the planned survey period. Several survey days were cut short due to weather that was worse than forecast.

RESULTS

An effort was made to cover the Cliff Road site on 23 days. Weather interfered with full coverage on 3 days. 148 hours of coverage were completed. All raptors and turkey vultures determined to be migrants were recorded and entered into the hawkcount.org database. 246 total migrants were recorded. Of the 4 species for which detailed height and distance information was recorded, no Peregrine Falcons were observed. 35 Golden Eagles, 10 Northern Harriers and 12 Bald Eagles were determined to be migrating. In addition, 22 individual Bald Eagles were recorded as “local” or non-migrants¹.

Following the count, a quality control check of all field forms was carried out. This check found clarification needed for the flight paths of two birds. These were made as handwritten notes on the maps for 10/26/17 and 10/27/17.

The charts below show the numbers and percentages of these species by height and distance categories. Close is within 800 meters. Low is below 200 meters.

¹ Bald Eagle 10/25-7 and 10/25-3 were treated as if they were a single bird for this analysis.

TOTAL MIGRANTS BY DISTANCE AND HEIGHT

Category	Number	Percent
Close/Low	85	34.6
Close/High	30	12.2
Distant/Low	67	27.2
Distant/High	64	26
Total	246	

MIGRANTS BY DISTANCE AND HEIGHT EXCLUDING TURKEY VULTURES

Category	Number	Percent
Close/Low	75	37.5
Close/High	26	13
Distant/Low	54	27
Distant/High	45	22.5
Total	200	

GOLDEN EAGLES BY DISTANCE AND HEIGHT

Category		Percent
Close/Low	19	54.3
Close/High	3	8.6
Distant/Low	6	17.1
Distant/High	7	20
Total	35	

BALD EAGLE MIGRANTS BY DISTANCE AND HEIGHT

Category		Percent
Close/Low	5	33.3
Close/High	1	6.7
Distant/Low	7	46.7
Distant/High	2	13.3
Total	15	

BALD EAGLE NON-MIGRANTS BY DISTANCE AND HEIGHT

Category		Percent
Close/Low	9	40.9
Close/High	2	9.1
Distant/Low	10	46.7
Distant/High	1	4.5
Total	22	

NORTHERN HARRIERS BY DISTANCE AND HEIGHT

Category		Percent
Close/Low	8	80
Close/High	1	10
Distant/Low	0	0
Distant/High	1	10
Total	10	

COMPARISON OF CLIFF ROAD FLIGHT WITH THE FLIGHT AT FRANKLIN MOUNTAIN

The Franklin Mountain Hawk Watch is a well-known concentration point for migrating raptors in the Upper Susquehanna Watershed. Data has been collected at the site since 1989. On days with good migratory potential, multiple observers are typically present, contributing to the count. The Cliff Road site was always surveyed by a single observer.

Of the 23 days with some effort at Cliff Road, there was coverage at the Franklin Mountain Hawk Watch on all but one day. This analysis is limited to only days that were surveyed at Cliff Road. Total hours of coverage were similar at the two sites – 148 at Cliff Road, 144 at Franklin Mountain. Franklin Mountain totaled 871 migrants. Cliff Road had 246 migrants (28% of the Franklin Mountain total). Golden Eagle totals were 136 and 35 (26%) respectively. Migrating Bald Eagles totals were 62 and 12 (19%) respectively. Northern Harriers totaled 5 at Franklin Mountain. Cliff Road recorded 10 (200%). Data on non-migrant Bald Eagles is only recorded as casual field notes at Franklin Mountain limiting its value for this analysis.

Noteworthy days at Franklin Mountain during the survey period included 5 days with 10 or more Golden Eagles. On each of those days fewer Golden Eagles were observed at Cliff Road. On the 2 days with the highest counts – 11/10 and 11/27 – no Golden Eagles were counted at Cliff Road. This suggests that on days with weather conditions that are ideal for concentrating Golden Eagles at Franklin Mountain, they move in their SW migratory direction somewhere out of sight of the Cliff Road site.

There were 3 days when Golden Eagle numbers at Cliff Road exceeded those at Franklin Mountain – 10/26, 11/11 and 11/24. The highest count at Cliff Road was on 11/11. This was the day after 21 Golden Eagles were recorded at Franklin Mountain. This is an interesting phenomenon that might indicate broad front movements of Golden Eagles through the surrounding area following very concentrated movements at Franklin Mountain.

Since the limited DOAS Cliff Road data set does not have any similar sequence, this possibility of broad front movements following big Franklin Mountain days should be further investigated. A similar pattern occurred on 11/27 and 11/28. Unfortunately, DOAS could not get an observer to Cliff Road on the 28th. If Bluestone Wind data are available for 11/28, it should be examined in this context.

Migrating Bald Eagle numbers were modest at Cliff Road during the period. Non-migrating Bald Eagles numbers were considerably higher than those of migrants. On the 3 highest Bald Eagle days at Franklin Mountain, none were counted as migrants at Cliff Road.

The Northern Harrier count at Cliff Road was double that at Franklin Mountain Hawk Watch.

SPECIES COMPARISON FOR DAYS WHEN SURVEYS WERE CONDUCTED
AT CLIFF ROAD

	GOLDEN EAGLE		BALD EAGLE		NORTHERN HARRIER		GROSS MIGRANTS		HOURS	
DATE	CLIFF RD	FMHW	CLIFF RD	FMHW	CLIFF RD	FMHW	CLIFF RD	FMHW	CLIFF RD	FMHW
10/25/17	0	1	1	4	1	1	20	64	7	7.75
10/26/17	6	0	4	5	2	1	31	142	7	7
10/27/17	1	1	2	1	0	0	11	17	7	6
10/31/17	1	2	2	1	0	1	14	30	7	7
11/01/17	0	NA	0	NA	0	NA	0	NA	3	NA
11/03/17	0	0	0	0	0	0	4	12	4	3.5
11/04/17	0	0	2	3	5	1	85	181	7	6.5
11/06/17	0	0	0	0	0	0	0	0	0.5	3.75
11/07/17	1	8	0	2	0	0	14	67	7	6
11/08/17	0	3	0	5	0	0	7	36	7	8
11/09/17	1	5	0	0	0	0	3	7	7	6
11/10/17	0	21	0	10	1	0	3	77	7	7.5
11/11/17	9	4	1	3	1	0	23	47	7	7.5
11/12/17	1	1	0	1	0	0	3	9	7	6.5
11/13/17	0	0	0	0	0	0	0	0	7	6
11/14/17	0	1	0	1	0	0	0	9	7	6.5
11/17/17	3	18	0	14	0	0	6	53	7	7.75
11/20/17	2	10	0	3	0	0	4	26	7	6
11/22/17	1	14	0	0	0	0	5	15	7	8
11/24/17	2	1	0	1	0	0	3	8	7	7
11/25/17	0	0	0	0	0	0	0	1	7	5
11/26/17	7	15	0	0	0	0	10	25	7.5	7
11/27/17	0	31	0	8	0	1	0	45	7	7.5
TOTALS	35	136	12	62	10	5	246	871	148	143.75

Complete Franklin Mountain Hawk Watch data can be viewed at hawkcount.org.
Requests for those data in spreadsheet format should be sent to andymason@earthling.net.

INCIDENTAL OBSERVATIONS

DOAS observers were instructed to record observations of birds other than raptors if they were federally listed species or in large flocks (over 50 birds). In addition to these guidelines, observers were encouraged to record any observations they thought were noteworthy. These data have not been entered into a spreadsheet. This summary contains numbers and species only. Details, including the height and distance, can be found on the Incidental Wildlife Forms for each date at the web link below.

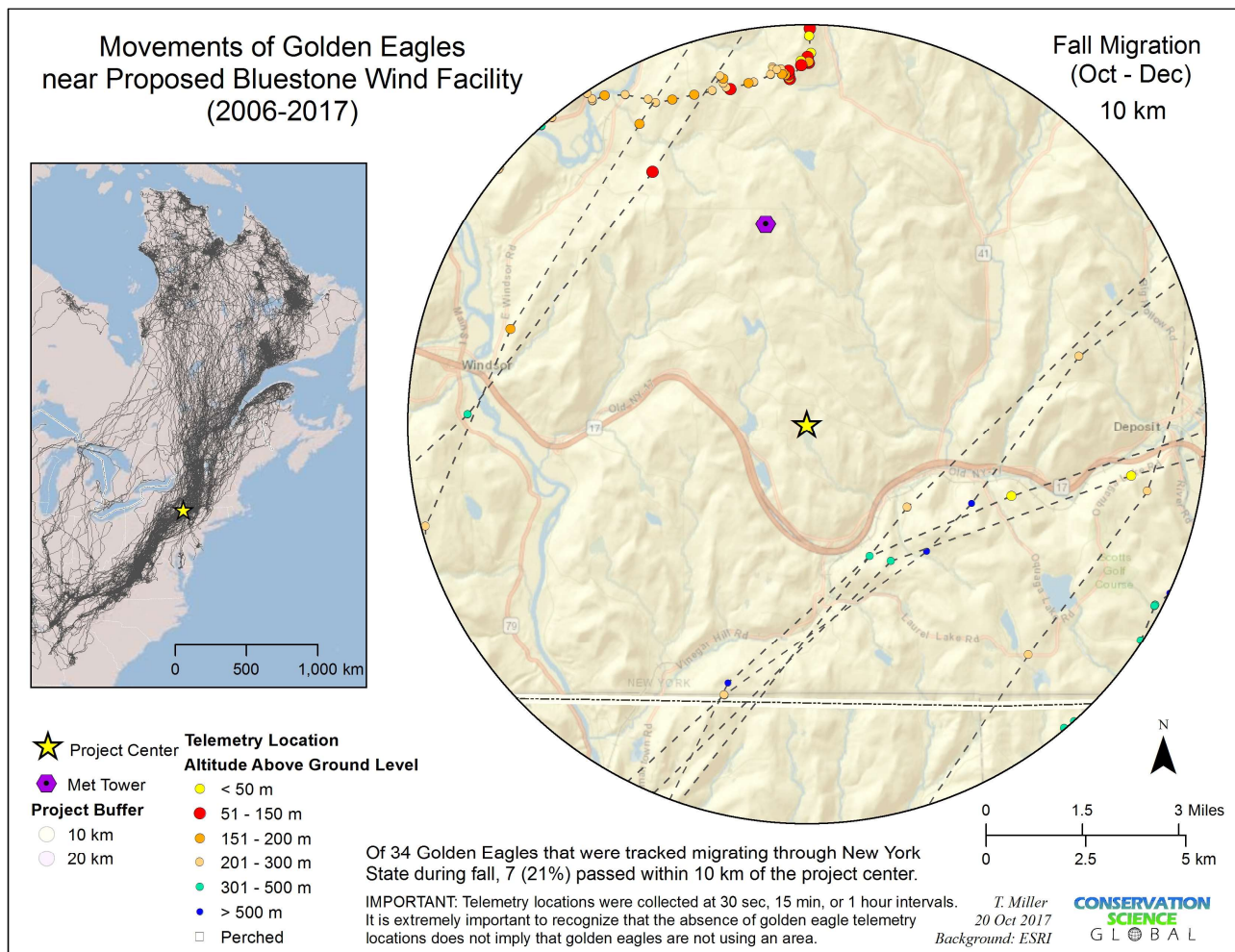
- Flock of 50 Red-winged Blackbird on 10/26/17.
- ~1000 passerines, mostly Icterids in 6 flocks on 11/4/17. The majority of these birds were likely Red-winged Blackbirds.
- 85 American Crow on 11/4/17.
- 462 Canada Goose in 2 flocks on 11/7/17. 1300 in several flocks on 11/27/17.
- Flock of 120 gulls (species?) on 11/20/17.
- Common Loon was reported on numerous occasions in field notes on HMANA forms, and occasionally on the Listed Species Form. Common Loon is a NYS Species of Special Concern. Maximum was 11 on 11/10/17.
- Common Raven were recorded on the Incidental form twice. These were groups that were noteworthy because they were large numbers for the species: 30 on 10/25/17; 20 on 10/26/17.

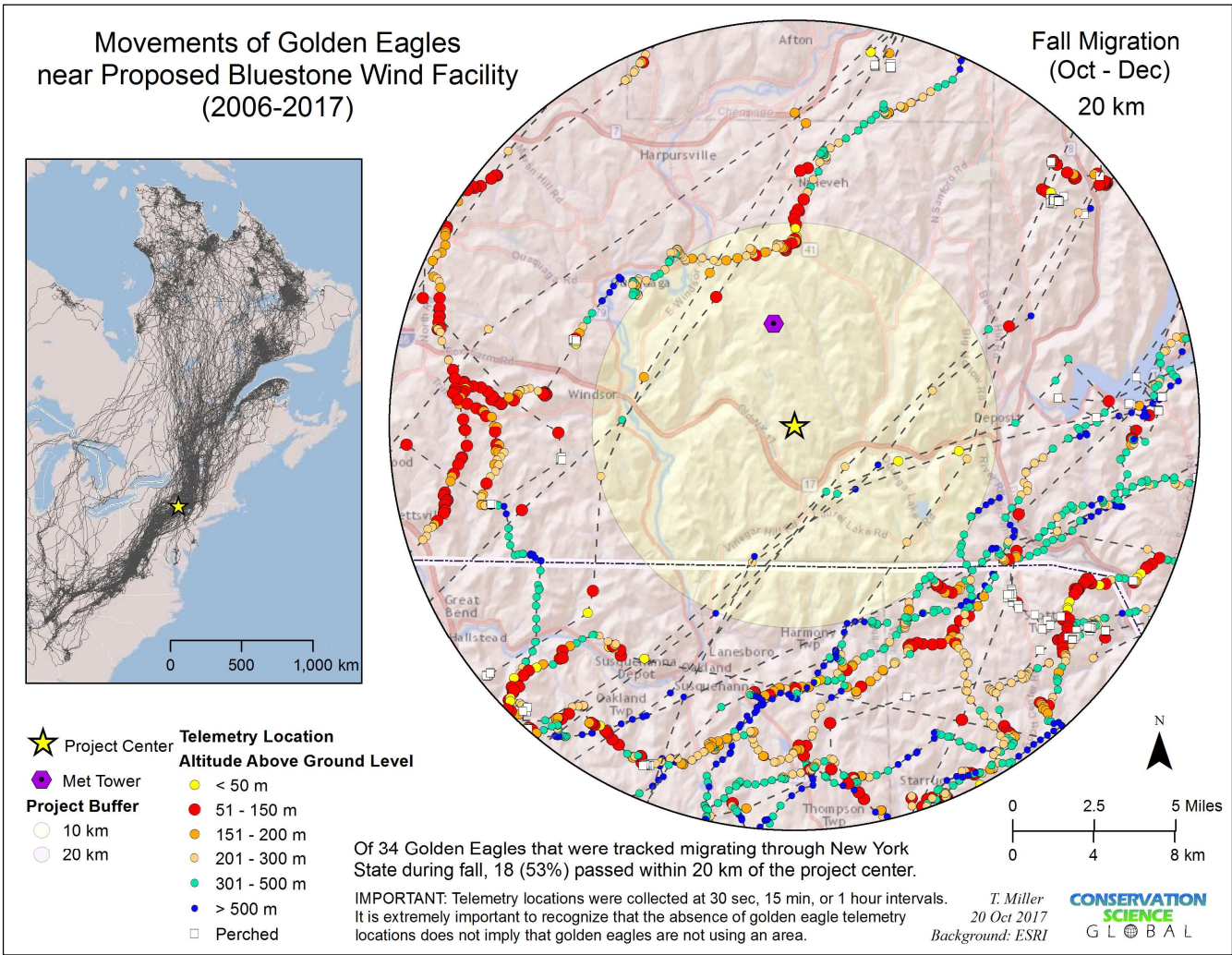
(Scanned copies of all field data forms can be found at:
<https://drive.google.com/drive/folders/1MuMa5KabJJH1bLTPCz-q06ZKfxMjnAg8?usp=sharing>)

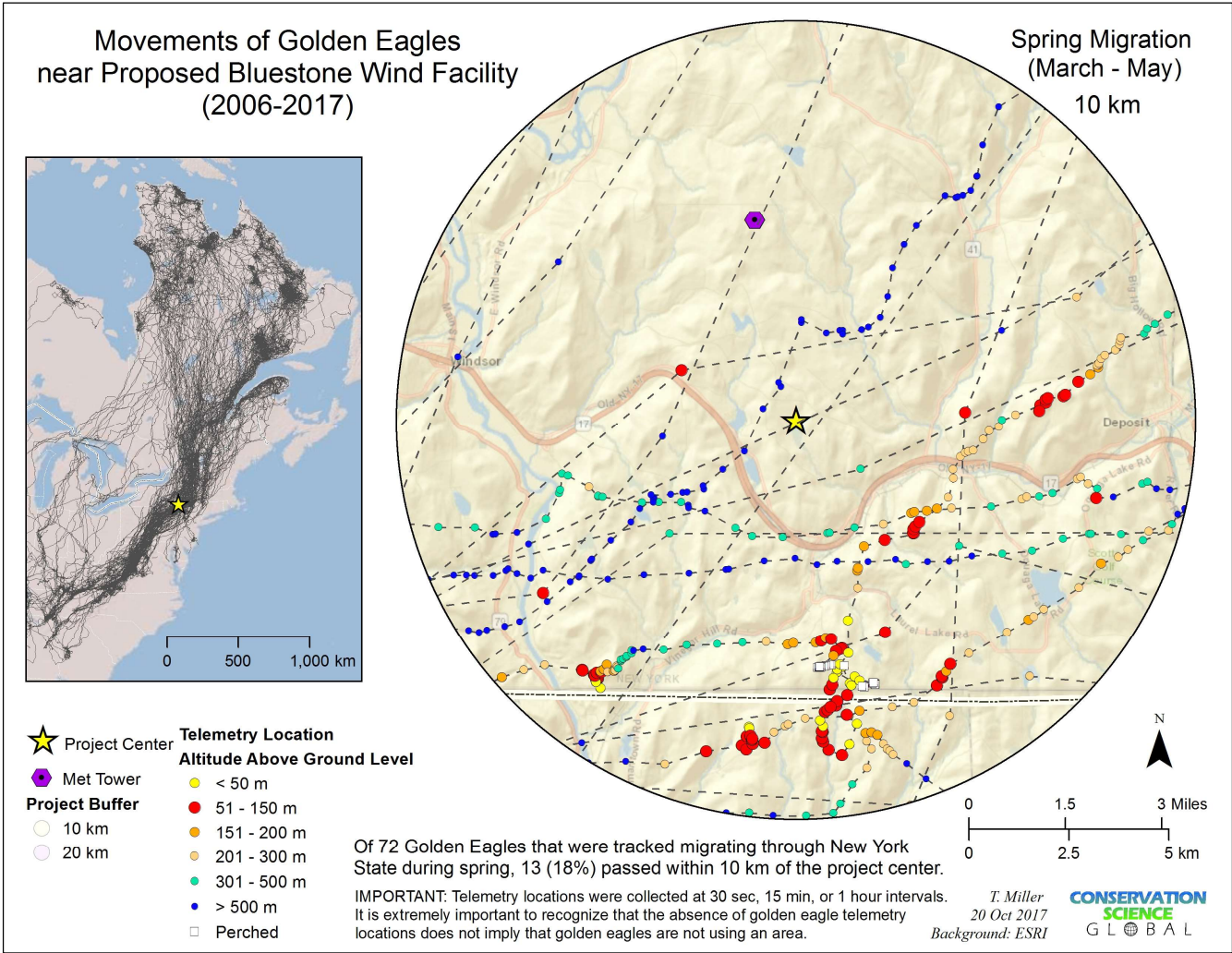
Attachments:

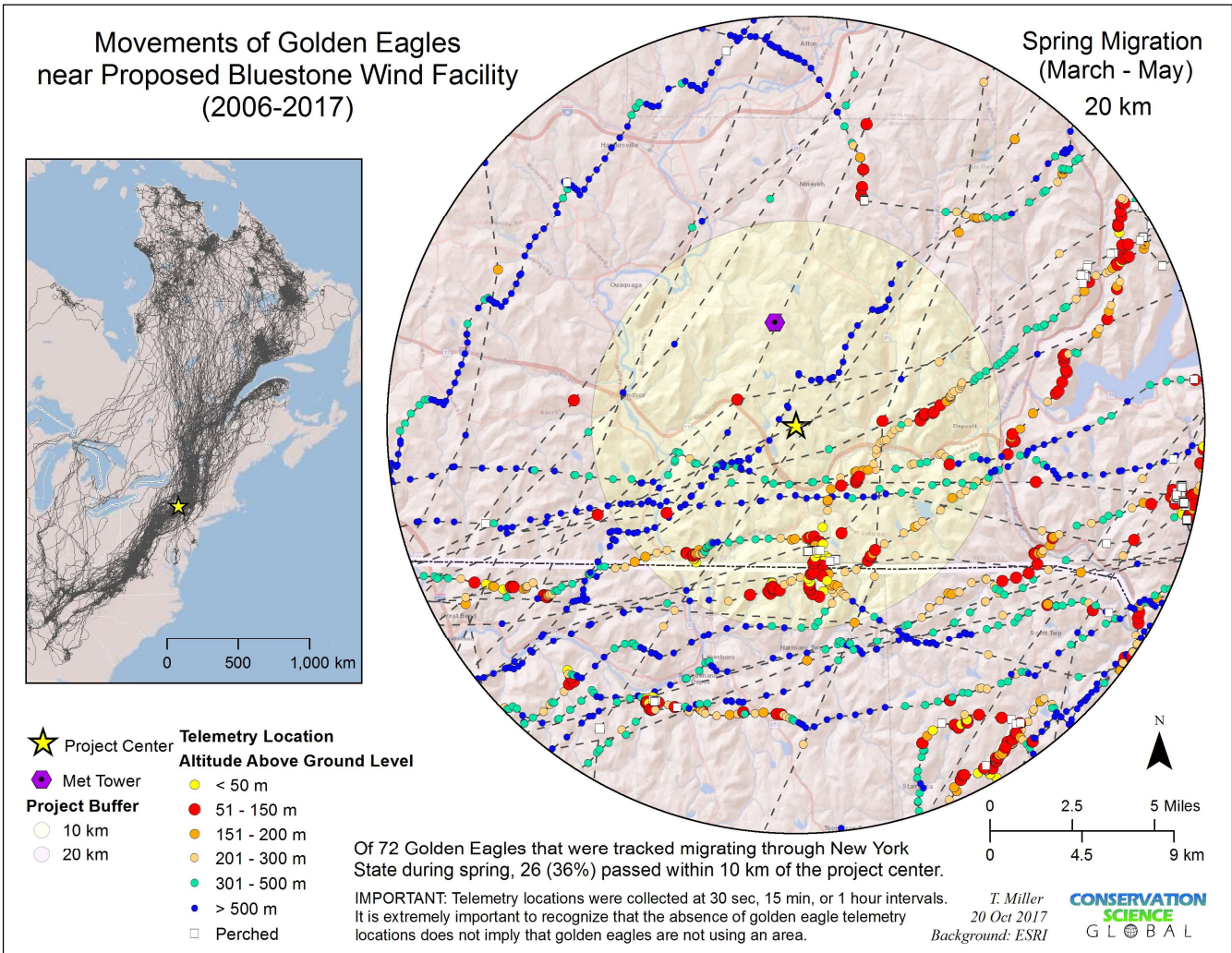
1. Conservation Science Global maps
2. DOAS Fall raptor migration survey protocol
3. DOAS Cliff Road daily totals
4. Listed Species data

Attachment 1.









Attachment 2.

DOAS Fall Raptor Migration Survey protocol for the Bluestone Project Area

DOAS Raptor migration surveys will consist of counts of raptors at a fixed-point location in the project area. Surveys will be conducted on 20 days judged to be either acceptable, or good migrating weather from October 25 to November 25, 2017. The timing of the surveys targets Golden Eagle but all raptor and vulture species will be recorded. A single site was chosen based upon a combination of viewshed and the known use of the area by GPS tracked Golden Eagles (42.017184° -75.545329°). Surveys will cover 7 hours each day, with the option of an additional hour should birds be moving persistently. Surveys will be planned to start at 0800 hours EST. Weather conditions may determine an earlier or later start time. Surveys will not be conducted on days forecast to have strong and persistent S or SW winds, heavy rain, heavy snow, dense fog or extremely low cloud ceiling conditions that would limit visibility.

All migrating raptors seen during each survey will be recorded and entered into the hawkcount.org database.

Details on every individual of 4 NYS listed species - Bald Eagle, Golden Eagle, Northern Harrier and Peregrine Falcon – will be recorded on a daily data sheet and a daily map. Each bird's sequential number will be referenced on the map. Data for individual birds will include: species; age; time of nearest passage to observation site (EST); height above ground level at the time of observation (greater or less than 200m); distance from observation site (greater or less than 800m); migrant vs. "local"; and for "local" birds notes on behavior. For the purpose of this study, "local" will only mean the bird was not migrating. Any comments or unusual observations will be also noted.

The field map will be prepared from the 2016 USGS topo map. It will be marked with the survey location and an 800 meter radius circle.

Eagle migration in our region is typically from NE to SW in fall. Weather conditions and terrain will affect the exact direction birds are moving at any time. For this study migratory behavior will be defined as a bird moving persistently or deliberately in a direction ranging from SSE to W. Stalling briefly to look for prey will not cause a bird to be excluded from the migratory bird count.

On days with high migratory movement, most birds will be moving in the migratory direction. This minimizes the possibility that birds may be double counted. On days with limited migratory movement, "local" birds may also move in a migratory direction. To prevent double counting, surveyors will note distinguishing characteristics of birds passing the site, i.e. multiple birds together, missing feathers, age, state of molt, etc. Using that information, any birds counted as migrants that are then judged to have returned to the area, will be removed from the migrant count and reassigned the designation of "local" birds.

"Local" birds will be defined as those moving in directions outside the migratory range, those making significant changes of direction, those engaged in extended kiting or hunting behavior, and perched birds. If there is doubt about whether a bird is a migrant or local bird, it will be recorded as a local bird. For local birds that are seen multiple times during a survey day, and recorded with multiple tracks on the map, the original assigned number from the daily sheet will be maintained.

The date, start and end time of the survey, and weather information will be recorded hourly in hawkcount.org data fields. Weather information will include: temperature [°C]; wind speed (Beaufort Scale); wind direction; precipitation; cloud cover (%); and, visibility (km). The timing of any cold or warm fronts passing through, and any low cloud ceiling heights that could impact the survey will be recorded in "weather" notes.

Attachment 2. (con't.)

The following data will be recorded hourly for all raptors and vultures exhibiting migratory behavior:

- The number of individuals of each species passing the site;
- Each individual will be placed in a height and distance category in relation to the survey site: close and low (<800m/<200m); close and high (<800m/>200m); distant and low (>800m/<200m); and, distant and high (>800m/>200m). Note: If a GE, BE, NH or PG is low outside the 800m threshold but high within it, that must be noted in the field notes.
- When species cannot be determined, birds will be recorded as one of the following categories:
 - unknown raptor (UR)
 - unknown accipiter (UA)
 - unknown eagle (UE)
 - unknown falcon (UF)

Hourly data will be entered into a hawkcount.org account at the end of each day, or as soon as possible.

If state or federally listed species are observed or large flocks (greater than 50 individuals) of other bird types (i.e., waterfowl, shorebirds, corvids, and passerines) are observed during the surveys, they will be recorded on an incidental wildlife observation data sheets. The data recorded are similar to those described above, including observation number, date, time, species, number of individuals, distance and height from observer, sex/age class, habitat, and any noteworthy behavior.

After data entry, all field sheets (map, daily data sheet, tally sheet for migrants, incidental observation sheet) will be stapled together and submitted to Andrew Mason or Thomas Salo. These documents will be scanned and made available to interested parties. Data from these documents will be summarized in a final report of the fall season surveys.

Quality checks:

- After data entry, surveyors will confirm that listed species on the daily data sheet have been entered correctly according to distance and height.
- After submission of the field forms, a qualified individual other than the surveyor will review each day's data for errors.

Attachment 3.

DOAS Cliff Rd. Fall 2017 daily totals

Date	Duration (min)	BV	TV	OS	BE	NH	SS	CH	NG	RS	BW	RT	RL	GE	AK	ML	PG	UA	UB	UF	UE	UR	TOT
10/25/17	420	0	7	0	1	1	5	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	20
10/26/17	420	0	8	0	4	2	6	0	1	0	0	4	0	6	0	0	0	0	0	0	0	0	31
10/27/17	420	0	4	0	2	0	2	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	11
10/31/17	420	0	0	0	2	0	1	0	0	0	0	10	0	1	0	0	0	0	0	0	0	0	14
11/1/17	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/3/17	240	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
11/4/17	420	0	23	0	2	5	7	6	0	4	0	35	0	0	1	2	0	0	0	0	0	0	85
11/6/17	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/7/17	420	0	2	0	0	0	1	1	0	0	0	9	0	1	0	0	0	0	0	0	0	0	14
11/8/17	420	0	1	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7
11/9/17	420	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	3
11/10/17	420	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
11/11/17	420	0	0	0	1	1	0	0	0	3	0	9	0	9	0	0	0	0	0	0	0	0	23
11/12/17	420	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	3
11/13/17	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/14/17	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/17/17	420	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	2	6
11/20/17	420	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	4
11/22/17	420	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0	1	5
11/24/17	420	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3
11/25/17	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/26/17	450	0	0	0	2	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	1	0	10
11/27/17	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	8880	0	46	0	15	10	23	7	1	7	0	94	0	35	1	2	0	0	0	0	1	4	246

BV=Black Vulture; TV=Turkey Vulture; OS=Osprey; BE=Bald Eagle; NH=Northern Harrier; SS=Sharp-shinned Hawk; CH=Cooper's Hawk; NG=Northern Goshawk;
 RS=Red-shouldered Hawk; BW=Broad-winged Hawk; RT=Red-tailed Hawk; RL=Rough-legged Hawk; GE=Golden Eagle; AK=American Kestrel; ML=Merlin;
 PG=Peregrine Falcon; UA= Unidentified Accipiter; UB=Unidentified Buteo; UF= Unidentified Falcon; UE= Unidentified Eagle; UR=Unidentified Raptor

(All hourly data, including surveyor, weather information, and height and distance information is available at: <https://drive.google.com/drive/folders/1MuMa5KabJJHlLTpCz-q06ZKfxMjnAg8?usp=sharing>)

Attachment 4.

DOAS Cliff Rd. Fall 2017 Listed Species Data

BIRD	SPECIES	AGE	TIME	HEIGHT> 200M	DISTANCE> 800M	MIGRANT Y/N	BEHAVIOR	FIELD NOTES
10/25-1	BE	Juv.	10:30	Low	Far	N	S-A-Flap	10/25-1&2 are likely same unnumbered birds shown on the map at 11:30. At 11:30 - low - far - exhibited aggression
10/25-2	BE	Juv.	10:30	Low	Far	N	S-A-Flap	
10/25-3	BE	Juv.	10:58	Low	Close	N	S-G	
10/25-6	BE	Ad.	12:15	Low	Far	N	S-G	
10/25-7	BE	Juv.	12:35	Low	Close	N	S-G	Could be same bird as 3 - started low - soared high (treated as the same bird in the DOAS report)
10/25-8	BE	Ad.	14:12	Low	Close	N	F-S-G	Bird dropped below line of sight, later re-emerged soaring
10/26-6	BE	Ad.	8:56	Low	Close	N	S	
10/26-12	BE	Juv.	10:42	High	Far	N	S	
10/26-13	BE	Ad.	11:58	Low	Far	N	S	
10/31-1	BE	Juv.	9:00	Low	Far	N	G	Dropped
10/31-5	BE	Ad.	12:12	Low	Far	N	S-G	
11/04-8	BE	Juv.	11:01	Low	Close	N		
11/04-9	BE	Ad.	11:55	High	Close	N		
11/04-10	BE	Juv.	14:16	Low	Far	N		
11/04-11	BE	Ad.	14:43	High	Close	N		
11/09-1	BE	Juv.	10:22	Low	Close	N	S	
11/09-2	BE	Juv.	10:26	Low	Close	N	Flap	
11/10-2	BE	Ad.	14:10	Low	Close	N	Flap-For-Glide	
11/11-6	BE	Ad.	11:18	Low	Far	N		
11/11-13	BE	Juv.	14:48	Low	Far	N		Photographed multiple individuals*
11/20-2	BE	Juv.	11:05	Low	Close	N	G	
11/26-1	BE	Juv.	10:00	L	Far	N	S-G	
11/27-1	BE	Juv.	12:05	Low	Close	N	For-Gliding	
10/25-5	BE	Ad.	11:22	Low	Far	Y	S-G	Started low (<100m), soared above 200m, went into glide
10/26-8	BE	Juv.	9:20	High	Close	Y	S	
10/26-9	BE	Ad.	9:50	Low	Far	Y	S	
10/26-14	BE	Juv.	12:19	Low	Far	Y	S	
10/26-15	BE	Juv.	12:58	Low	Close	Y	S	
10/27-1	BE	Juv.	9:35	Low	Close	Y	F-S	
10/27-2	BE	Juv.	9:55	Low	Close	Y	F-S	

Attachment 4. (con't.)

10/31-3	BE	Juv.	12:04	Low	Far	Y	G	
10/31-4	BE	Juv.	12:09	High	Far	Y	G	
11/04-3	BE	Juv.	9:52	High	Far	Y		
11/04-6	BE	Juv.	10:10	Low	Far	Y		
11/11-5	BE	Ad.	11:15	Low	Far	Y		
11/24-1	BE	Juv.	10:45	Low	Close	Y	Flap-G	
11/26-9	BE	Ad.	14:34	L	Close	Y	F-G	Came up from below horizon
11/26-10	BE	Juv.	14:40	L	Close	Y	F-G	
10/26-1	GE	Juv.	8:05	Low	Close	Y	S	
10/26-2	GE	Juv.	8:05	Low	Close	Y	S	
10/26-4	GE	Ad.	8:40	Low	Close	Y	S	
10/26-5	GE	Juv.	8:56	Low	Close	Y	S	
10/26-10	GE	Ad.	9:55	High	Far	Y	S	
10/26-11	GE	Ad.	9:56	High	Far	Y	S	
10/27-3	GE	Juv.	10:00	Low	Far	Y	S	
10/31-2	GE	Juv.	9:54	Low	Far	Y	Flap-G	Kept pushing along ridge
11/09-3	GE	Ad.	12:21	Low	Close	Y		Photographed*
11/11-1	GE	Ad.	9:19	High	Far	Y		
11/11-2	GE	Ad.	9:58	High	Far	Y		
11/11-3	GE	Ad.	10:14	Low	Far	Y		
11/11-4	GE	Juv.	11:14	Low	Far	Y		
11/11-7	GE	Ad.	11:23	High	Far	Y		
11/11-8	GE	Juv.	11:38	High	Far	Y		
11/11-9	GE	Juv.	12:21	High	Far	Y		
11/11-11	GE	Juv.	14:34	High	Close	Y		
11/11-12	GE	Juv.	14:40	Low	Close	Y		
11/17-1	GE	Unk	9:30	Low	Close	Y	Flap-G	
11/17-2	GE	Ad.	9:55	Low	Close	Y	S-G	
11/17-3	GE	Ad.	12:40	Low	Close	Y	Flap-G-S	Disappeared below horizon
11/20-1	GE	Unk	10:43	Low	Close	Y	Flap-G	
11/20-3	GE	Unk	11:30	Low	Close	Y	Flap-G	

Attachment 4. (con't.)

11/22-1	GE	Ad.	13:45	Low	Close	Y	S-Gliding	
11/24-2	GE	Ad.	11:32	Low	Close	Y	G	
11/24-3	GE	Juv.	11:37	Low	Close	Y	Flap-G	
11/26-2	GE	Ad.	12:26	L	Close	Y	S-G	
11/26-3	GE	Ad.	12:36	L	Close	Y	S-G	
11/26-4	GE	Ad.	12:58	L	Close	Y	G-Flap	
11/26-5	GE	Ad.	13:20	H	Close	Y	S-G	Harassed by raven
11/26-7	GE	Ad.	14:10	H	Close	Y	S-G-Flap	
11/26-8	GE	Juv.	14:17	L	Close	Y	S-G	
11/26-11	GE	Ad.	14:55	H	Far	Y	S	
11/07-1	GE	Ad.	13:45	Low	Close	Y	Gliding	
10/25-4	NH	Ad.	11:12	Low	Close	Y	G	
10/26-3	NH	Ad.	8:27	Low	Close	Y	Flap	
10/26-7	NH	Ad.	8:57	Low	Close	Y	Flap	
11/04-1	NH	Ad.	8:55	Low	Close	Y		Adult male
11/04-2	NH	UNK	9:25	High	Far	Y		
11/04-4	NH	Ad.	10:01	Low	Close	Y		Adult female
11/04-5	NH	Juv.	10:01	Low	Close	Y		Bird 4 & 5 flying together
11/04-7	NH	Juv.	10:40	Low	Close	Y		
11/10-1	NH	Unk	13:30	Low	Close	Y	Flap	
11/11-10	NH	Ad.	12:51	High	Close	Y		
11/26-6	UE		13:46	L	Far	N	G	

Behavior Codes: P = Perched; S= Soaring; Flap = Flapping; For = Foraging; g = Gliding; A = Aggression or Territorial Defense; and, O= Other

(Complete daily listed species forms are available at: <https://drive.google.com/drive/folders/1MuMa5KabJJHlLTPCz-q06ZKfxMjnAg8?usp=sharing>)