2019 Stearns Lake Eagle Nest Monitoring Report
City and County of Broomfield Open Space and Trails
Broomfield, Colorado

Prepared for—
City and County of Broomfield Open Space and Trails
1 DesCombes Drive
Broomfield, Colorado 80020

Prepared by—
ERO Resources Corporation
1842 Clarkson Street
Denver, Colorado 80218
(303) 830-1188
ERO Project #6950

January 21, 2020
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Introduction

Garrett Construction Company LLC (Garrett) is constructing the Caliber at Flatirons Housing development (Project), a multifamily apartment complex immediately east of the intersection of 96th Street and Via Varra in Broomfield, Colorado (project area; Figure 1). A bald eagle (*Haliaeetus leucocephalus*) nest (Stearns Lake nest) was located less than 600 feet from the eastern edge of the project area and 0.6 mile west of Stearns Lake (Figure 2). ERO Resources Corporation (ERO) has been assisting the City and County of Broomfield Open Space and Trails (City) with guidance on bald eagle protection and began monitoring the nest in February 2018. Monitoring continued throughout 2019. ERO has prepared this report to provide an update on the Stearns Lake nest and its occupants and to summarize the 2019 monitoring efforts. For a comprehensive report on the history and context of the Stearns Lake nest, see information provided in previous ERO memorandums (ERO 2017, 2018a, 2018b, 2018c) and a U.S. Fish and Wildlife Service (Service) environmental assessment (EA; Service 2018). The background on Stearns Lake nest monitoring, ERO nest monitoring methods and changes, and a summary of ERO’s 2018 and 2019 nest monitoring results are presented below.

Background

The Stearns Lake nest, an active bald eagle nest, was located in a cottonwood tree on private property with a conservation easement about 0.4 mile directly east of the intersection of 96th Avenue and Northwest Parkway (Figure 1). The Project construction boundary is 530 feet west of the Stearns Lake nest. In November 2017, Garrett applied for an eagle incidental take permit (ITP) for the Project. The Service prepared an EA to evaluate potential effects of issuing an eagle ITP for disturbance take of bald eagles associated with the Project (Service 2018) and issued an ITP to Garrett authorizing disturbance of up to two bald eagles, including the loss of productivity (i.e., eggs or young) due to potential abandonment of the eagle nest during construction activities (Permit No. MB66357C-0). The permit required monthly monitoring through the nesting seasons (January 1 through August 31) from 2018 to 2021, or until project construction is complete. An additional condition of the ITP (G[2]) required that construction activities within a 660-foot buffer around the nest be managed to occur either outside the sensitive time (January 1 to July 31) or after a qualified biologist determines that the nesting attempt failed or that the eaglets successfully fledged. Other mitigation and monitoring requirements are described in the ITP and the associated EA (Service 2018).
Figure 2
Nest Location, Buffers, Observation Points, and Perches
Early 2019

Broomfield Eagle Evaluation
Sections 21, 22, 27, and 28, T15S, R69W; 6th PM
UTM NAD 83: Zone 13N; 489933mE, 4422082mN
Longitude 105.117848°W, Latitude 39.948812°N
USGS Lafayette, CO Quadrangle
City and County of Broomfield and Boulder County, Colorado

Image Source: Google© Earth September 12, 2019

Prepared for: City of Broomfield
Open Space and Trails
File: 6950 Figure 2.mxd (WH)
January 20, 2020
In addition to the requirements of the ITP, Garret agreed to a series of avoidance, minimization, and mitigations measures for the eagles that were incorporated into the Subdivision Improvement Agreement (SIA). The SIA included restrictions on construction activities during the active eagle breeding season, nighttime, and inclement weather. Specifically, the SIA provided that Garrett agrees to “construction mitigation steps within the 660 foot buffer area around the eagles nest during sensitive times in the egg laying and incubation season. During egg laying and incubation season (February 1 through April 30), the Developer also agrees to conduct monitoring three times per week for a minimum of 3 hours each.” The SIA further established time-limited stop work authority that was later modified in a 2019 Letter of Understanding to require year-round monitoring and stop work authority.

Construction at the Caliber at Flatirons Housing development began in 2018 and continued throughout the year with biological monitoring by Garret occurring according to the permit conditions. The ITP for the Project was then challenged in court, and was subsequently vacated and remanded on December 13, 2018. Garret volunteered to adhere to the terms of the ITP and the SIA.

As part of the SIA with the City, Garrett agreed to the following covenants and promises pertaining to the eagles:

1. Temporary hay bale wall construction;
2. Construction storage and operation yards located away from eagles;
3. Community outreach nest monitoring reports;
4. Eagle awareness training for employees and contractors;
5. Egg laying and incubation season (March to April) monitoring;
6. Construction analysis reports and activity modifications; and
7. United States Fish and Wildlife Service Eagle Permit mitigation measures.

As requested by the City, ERO has periodically monitored the nest since February 2018. ERO’s 2018 monitoring included conducting weekly surveys prior to construction to gather baseline information. Survey intensity was increased as construction started and continued through fledging and dispersal of the young. ERO was not originally contracted in 2018 to conduct monitoring after eagles had fledged and were no longer dependent on the nest. At the request of City Council, ERO subsequently reinitiated monitoring in the fall/winter of 2018 to ensure initial courtship and nest building were observed and any potential construction disturbances were avoided or minimized.

Year-round monitoring continued during the 2019 breeding season to detect any adverse reaction displayed by the breeding eagles in response to project activities and to execute the stop work authority to stop or modify construction activities, as needed, to minimize disturbance to the Stearns Lake bald eagle nest. Detailed data including weather conditions, eagle nesting activity, and eagle movements to and from the nest site were documented as described below.
Monitoring Methods

The primary goal of ERO’s Stearns Lake nest monitoring is to identify adverse behavioral reactions to disturbances related to the Project. ERO initially developed monitoring protocols in 2018, which were adapted from Bird Conservancy of the Rockies Eagle Watch protocols. The primary adaptation was the addition of seven disturbance indicators based on scientific literature and correspondence with raptor experts. ERO also recorded other detailed monitoring data, including time of observation, weather conditions, number of adults and young eagles observed, and eagle behaviors. These protocols were further modified prior to the 2019 breeding season following recommendations from the City and the Open Space and Trails Advisory Committee in September 2018. Changes to monitoring protocols included altering the monitoring frequency and duration by nesting phase, collecting data continuously, and, at discreet three-minute intervals, applying new disturbance indicators and conducting noise monitoring (ERO 2018c). Additionally, supplemental notes were recorded on the type and level of disturbance from construction activities and other human-caused disturbances using a map to identify the locations of where disturbances took place and perch sites. For more information on methods, see the 2019 Bald Eagle Nest Monitoring Work Plan (ERO 2018d).

2018 Bald Eagle Nest Monitoring Observations

In 2018, courtship/nest construction and egg laying began prior to the first monitoring event on February 22. The last observation of nest incubation was on March 20, and hatching occurred sometime between March 20 and March 30, after which the observations of caring for the young were made. On April 17, 2018, the nest was damaged during a wind storm and only one nestling was observed after that date. Fledging was observed on June 25, and the last time the young were observed at the nest was July 25. Post-fledge/dispersal of the young in the area was noted after July 25 and although the adults were seen in the vicinity during August and September, the first nest-building behaviors for the next breeding season were not observed until October 11 (Table 1).

During 2018 observation periods, construction stop work orders were administered three times (May 22, May 29, and June 4) due to disturbance indicators from work activities noted by the biological monitors. On May 22, 2018, haybale wall construction at the eastern border of the project area was stopped for about 15 minutes after one of the adult bald eagles began circling over the project work area. Work resumed after the eagle left the area, and then was very briefly stopped again about ten minutes later to disable the back-up alarms when the eagle returned to soaring high over the project area. Once the back-up alarms were disabled, the eagle returned to perch in the nest tree and no additional disturbance indicators were observed that day. On May 29, 2018, work was stopped when fence post installation using a pneumatic post driver near the eastern border of the project area caused one of the eagles to intently stare with raised hackles. The workers moved further west and signs of distress were reduced within ten minutes. On June 4, 2018, work was stopped when a mini-trencher moved to the east side of the haybale wall to install a silt fence. After distress calls and one of the adults
left its perch to circle over the work area, the work was immediately stopped. The workers then took an hour lunch break and resumed work using hand tools only with no additional disturbance noted.

Disturbance-related behavioral reactions by the nesting eagles were observed three other times from nonconstruction-related activities, including nearby pedestrians, a helicopter, and the presence of a raptor. Other construction and nearby human-related activities, including freight trains, agricultural work, airplanes, and park recreation activities within the vicinity of the nest, did not appear to disturb the nesting pair.

In 2018, the Stearns Lake pair successfully fledged a single eaglet, which was the only one of three young that survived after severe winds destroyed a portion of the nest. Although successful, the pair was aware of construction activities and appeared disturbed as new activities were introduced at the site (e.g., hay bale construction and silt fence installation; see May 22, May 29, and June 4, 2018 monitoring reports for more detail), particularly those that occurred along the southern and eastern project area boundaries.

**2019 Bald Eagle Nest Monitoring Observations**

In 2019, the Stearns Lake pair built a new nest in the same tree that was used in 2018, and courtship and nest construction activities were observed in January 2019. Egg laying/incubation was first observed on February 13 and continued until approximately March 26. Nest brooding and caring for the young in the nest continued from hatching of the first egg, by approximately March 25, until fledging of two nestlings was observed on June 11. Post-fledge/dispersal of the young was observed after July 22 and although the adults were seen in the vicinity during August and September, the first nest-building behaviors for the next breeding season were not observed until October 8 after the Stearns Lake nest near the project area had completely deteriorated (Table 2). In November 2019, the pair had constructed a new nest south of Stearns Lake (Figure 3).

In 2019, construction activities were monitored year-round with survey intensity based on nesting phase and monitoring continued through fledging, dispersal, reinitiation of courtship, and nest building for the 2020 breeding season. Nest observations were mostly conducted from Observation Point A (Figure 2, Figure 3). Three other observation points at B, C, and D were also used during the 2019 monitoring (Figure 2, Figure 3). Data observations were made continuously and at discreet three-minute intervals, indicators of disturbance were recorded on datasheets, and construction activity and perch locations were identified on figures per the Front Range Bald Eagle Nesting Studies map.

Additional data collected during the 2019 nesting season included wind and noise measurements. Wind measurements were taken at approximately 30-minute intervals from the observation point, and noise measurements were only taken at the beginning and end of the monitoring period when at observation point A. Generally, the site was moderately windy, with winds staying less than 10 miles per hour (mph), but occasionally winds were measured up to 20 to 30 mph. Noise measurements ranged from approximately 40 dBA (decibel units), just less than sound levels in a library, up to approximately 70
dBA, the sound level of a washing machine or flushing toilet. No sound levels were recorded above 85 dBA, which can cause permanent damage to the human ear. Based on ERO’s observations, wind or noise levels did not appear to cause any disturbance to the nesting eagles.

In 2019, no construction stop work orders were given in response to work activities; however, one disturbance indicator was observed on April 26 when a construction-related back-up alarm went off. Behavioral reactions by the nesting eagles from natural and human-related causes not associated with construction activities were observed 31 times during the 2019 nesting period. These behavioral reactions were due to natural causes, such as the presence of competitors/predators (19) including northern harrier (1), subadult bald eagles (3), red-tailed hawks (11), an unknown falcon (1), a common raven (1), a red-winged blackbird (1), and a coyote (1); and human-related activities (11) including trains (3), an airplane (1), and human activity under the nest tree (7). At other times, construction and nearby activities, including the train, agricultural work, airplanes, and park recreation, did not elicit a detectable behavioral reaction from the nesting pair or young.

Contingency monitoring by ERO was also conducted in 2019. Searching surveys were conducted in June 2019, during a period when one of the fledglings disappeared. It was ultimately determined that the fledgling was hit by a car and killed along the Northwest Parkway on approximately June 18, 2019. Additional monitoring was also conducted in July 2019 during hay bale deconstruction, in August 2019 to confirm juvenile dispersal, in September 2019 during trail construction, and in December 2019 during fence construction. Monitoring was also conducted in October and November 2019, when a new nest was being constructed by the bald eagle pair at the “Stearns Perch F” location near the end of 104th Street (Figure 3), and in December 2019 during fence construction.
Figure 3
Nest Location, Buffers, Observation Points, and Perches
Late 2019

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File: 6950 Figure 3.mxd (WH)
January 20, 2020
As described above, the Stearns Lake pair successfully fledged two eaglets; however, one of the eaglets was killed on Northwest Parkway shortly after fledging. Based on correspondence with the Northwest Parkway maintenance worker who found the dead eagle, it is believed that the eagle’s death occurred on June 18, 2019.

In October 2019, the Stearns Lake pair was observed nest building at a new location (Stearns Perch F) south of Stearns Lake (Figure 3). Prior to building the new nest at Stearns Perch F, the pair was observed briefly performing nest building activities at Stearns Perch C (Figure 3) and also occasionally perching and night roosting in the trees at Del Corso Park, near the former nest location and project area. Occasional day use and night roosting in the vicinity of the former nest location at the Del Corso Park tree continued into early 2020. The pair typically returns to this location to roost at dusk or later; however, the Stearns Perch F nest has been substantially constructed and is the location where the pair is observed spending a majority of their time during the day.

**Conclusions and Recommendations**

Applying the disturbance indicator approach, construction activities were temporarily stopped or modified on three occasions in 2018. No stop work orders were administered in 2019. Implementing this monitoring strategy and the provisions in the various agreements/permit that related to this bald eagle pair through two complete bald eagle nesting cycles allowed construction activities to continue under certain conditions as close as 660 feet to an active nest and the bald eagles to successfully fledge young each year (Table 1 and Table 2; Figure 4). These agreements included: 1) the USFWS Permit: MB66357C-0, May 18, 2018; 2) the Subdivision Improvement Agreement, January 23, 2018; 3) the Letter of Understanding, April 11, 2018; 4) the Letter of Understanding, April 4, 2019; and 5) the First Amendment to the Letter of Understanding, April 13, 2019.

Comparing 2018 to 2019, hatching and fledging occurred earlier in 2019. The earlier fledge date observed in 2019 may be due to competition among nestlings. Based on experience, when only one young remains in the nest in many raptor species (as in 2018), the young tend to stay in the nest longer, being fed and cared for without competition.

Stop work orders were implemented with the full understanding and cooperation of construction workers and afforded the Stearns Lake bald eagle pair the opportunity to successfully fledge one eaglet in 2018 and two eaglets in 2019. Unfortunately, young eagles from the Stearns Lake nest were lost in both 2018 and 2019 from natural causes. In 2018, two eaglets were lost when severe winds partially destroyed the nest prior to fledging. In 2019, one eaglet died shortly after fledging when it was apparently hit by a car on a nearby highway. The Stearns Lake nest is located in a high wind area, and the nest has been fully or partially destroyed by strong winds during the nesting season or shortly after fledging in each of the last three years (2017 through 2019).

After dispersal in 2019, the adult pair spent increasing amounts of time approximately 1 mile east in the Stearns Lake area. The pair initiated some alternate nest construction in large cottonwood trees in this
area. Since November 2019, the pair has focused nest building activities on a single alternate nest located in a dead cottonwood tree south of Stearns Lake (Figure 3). Throughout December 2019 and continuing into 2020, the adult pair has continued to build on the nest and bring in finer materials for the inner nest bowl. As of mid-January 2020, all behavioral activities of this pair indicate that they will nest in the new alternate nest location.

The adult pair has continued to use the original nest tree and nearby trees for hunting perches and night roosting. Routine monitoring of the new nest location and the Del Corso Park roost trees by ERO is planned to occur once a week around dawn or dusk until the project is complete. Additionally, Garrett’s contracted biologists will monitor the roost trees adjacent to the project area any time work is conducted before 9 am or after 4 pm and occurs with the 660 foot buffer of the Del Corso Tree (Figure 3). Periodic monitoring of this area so far indicates that ongoing construction activities have not adversely altered the eagles’ hunting or roosting activities from these trees.

Once the project work activities are complete, additional periodic monitoring of this nesting pair should be conducted on a one to two-week basis, coordinated with Broomfield Eagle Watch volunteers, to confirm the status of this nest.
### Table 1. 2018 breeding season site visit dates and observed eagle activity.

<table>
<thead>
<tr>
<th>Month</th>
<th>Dates</th>
<th>Phase</th>
<th>Eagle Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>February</td>
<td>2/22/18</td>
<td>Egg Incubation</td>
<td>Courtship/nest construction and egg laying began prior to the first monitoring event on February 22.</td>
</tr>
<tr>
<td>March</td>
<td>3/1/18, 3/7/18, 3/12/18, 3/20/18, 3/30/18</td>
<td>Egg Incubation</td>
<td>Last observation of nest incubation was on March 20, and hatching occurred sometime between March 20 and March 30 – the first time caring for the young was observed.</td>
</tr>
<tr>
<td>April</td>
<td>4/5/18, 4/12/18, 4/19/18, 4/27/18</td>
<td>Brooding/caring for young</td>
<td>Both adults were observed brooding and caring for young.</td>
</tr>
<tr>
<td>May</td>
<td>5/2/18, 5/9/18, 5/16/18, 5/21/18, 5/22/18, 5/23/18, 5/24/18, 5/25/18, 5/29/18</td>
<td>Brooding/caring for young</td>
<td>Both adults were observed brooding and caring for young. Work stoppage due to observation of indicator of eagle disturbance on May 22 and 29.</td>
</tr>
<tr>
<td>June</td>
<td>6/1/18, 6/4/18, 6/9/18, 6/11/18, 6/12/18, 6/18/18, 6/20/18, 6/25/18</td>
<td>Brooding/caring for young, fledging, post-fledge – dependent on nest</td>
<td>Work stoppage due to observation of indicator of eagle disturbance on June 4. Fledging was observed on June 25.</td>
</tr>
<tr>
<td>July</td>
<td>7/6/18, 7/16/18, 7/23/18, 7/25/18, 7/31/18</td>
<td>Post-fledge – dependent on nest, post-fledge – dispersal</td>
<td>The last time the young were observed at the nest was July 25.</td>
</tr>
<tr>
<td>August</td>
<td>8/3/18, 8/6/18, 8/10/18, 8/17/18, 8/19/18, 8/26/18, 8/29/18, 8/30/18</td>
<td>Dispersal</td>
<td>Both adults were observed in the area in August.</td>
</tr>
<tr>
<td>September</td>
<td>9/4/18, 9/6/18, 9/13/18, 9/20/18, 9/27/18</td>
<td>Dispersal</td>
<td>Both adults were observed in the area in September.</td>
</tr>
<tr>
<td>October</td>
<td>10/1/18, 10/11/18, 10/17/18, 10/23/18</td>
<td>Courtship/nest construction</td>
<td>First nest-building behaviors were observed on October 11.</td>
</tr>
<tr>
<td>November</td>
<td>11/1/18, 11/8/18, 11/16/18, 11/21/18, 11/28/18</td>
<td>Courtship/nest construction</td>
<td>Nest construction/maintenance continues in November.</td>
</tr>
<tr>
<td>December</td>
<td>12/5/18, 12/12/18, 12/18/18, 12/28/18</td>
<td>Courtship/nest construction</td>
<td>Nest construction/maintenance continues in December.</td>
</tr>
</tbody>
</table>
Table 2. 2019 breeding season site visit dates and observed eagle activity.

<table>
<thead>
<tr>
<th>Dates</th>
<th>Phase</th>
<th>Eagle Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>1/2/19 - 1/4/19, 1/7/19 - 1/11/19, 1/14/19 - 1/18/19, 1/21/19 - 1/25/19, 1/28/19 - 1/31/19</td>
<td>Courtship/nest construction Nest construction/maintenance continues in January. Copulation event was observed on January 29.</td>
</tr>
<tr>
<td>February</td>
<td>2/1/19, 2/4/19, 2/5/19, 2/7/19, 2/11/19 - 2/15/19, 2/18/19 - 2/22/19, 2/25/19 - 2/28/19</td>
<td>Courtship/nest construction, egg incubation Egg laying/incubation was first observed on February 13.</td>
</tr>
<tr>
<td>April</td>
<td>4/1/19 - 4/5/19, 4/8/19 - 4/12/19, 4/15/19 - 4/19/19, 4/22/19 - 4/26/19, 4/29/19 - 4/30/19</td>
<td>Brooding/caring for young Both adults were observed brooding and caring for young.</td>
</tr>
<tr>
<td>May</td>
<td>5/1/19 - 5/3/19, 5/6/19 - 5/10/19, 5/13/19 - 5/17/19, 5/21/19 - 5/24/19, 5/28/19 - 5/31/19</td>
<td>Brooding/caring for young Both adults were observed brooding and caring for young.</td>
</tr>
<tr>
<td>June</td>
<td>6/3/19 - 6/7/19, 6/10/19 - 6/14/19, 6/17/19 - 6/21/19, 6/24/19 - 6/28/19</td>
<td>Brooding/caring for young, fledging, post-fledge dependent on nest Fledging of both nestlings was observed after June 11, and one of the juvenile eagles was believed to be hit by a car on Northwest Parkway approximately June 18, 2019. Monitoring increased mid-June after strange behavior by one of the juveniles and in searching attempts to locate the missing nesting.</td>
</tr>
<tr>
<td>July</td>
<td>7/1/19 - 7/3/19, 7/5/19, 7/8/19 - 7/9/19, 7/11/19, 7/16/19 - 7/19/19, 7/22/19, 7/25/19 - 7/26/19, 7/29/19 – 7/31/19</td>
<td>Post-fledge dependent on nest, post-fledge dispersal, dispersal Both adults and one juvenile seen in the vicinity early in the month. No eagles were observed between July 22 and August 9, 2019. One adult bald eagle was also observed bringing food to the juvenile on July 18 and July 19, 2019. Monitoring increased during hay bale wall removal and to confirm juvenile dispersal.</td>
</tr>
<tr>
<td>Dates</td>
<td>Phase</td>
<td>Eagle Activity</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>August</td>
<td>8/7/19, 8/9/19,</td>
<td>Both adults were seen in the vicinity. Monitoring increased to confirm juvenile</td>
</tr>
<tr>
<td></td>
<td>8/12/19 - 8/15/19,</td>
<td>dispersal.</td>
</tr>
<tr>
<td></td>
<td>8/21/19,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8/26/19 - 8/27/19</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>9/3/19, 9/12/19,</td>
<td>Both adults were seen in the vicinity.</td>
</tr>
<tr>
<td></td>
<td>9/17/19,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9/25/19</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>10/8/19 - 10/9/19,</td>
<td>First nest-building behaviors were observed on October 8, 2019 southeast of</td>
</tr>
<tr>
<td></td>
<td>10/14/19, 10/16/19,</td>
<td>the former nest location. Monitoring increased to determine the status of</td>
</tr>
<tr>
<td></td>
<td>10/22/19 - 10/24/19</td>
<td>nest building and location.</td>
</tr>
<tr>
<td>November</td>
<td>11/1/19, 11/5/19,</td>
<td>Nest construction and perching at the Stearns Perch F nest location, roosting,</td>
</tr>
<tr>
<td></td>
<td>11/13/19, 11/15/19,</td>
<td>and occasional day use at Del Corso Park nest trees were observed. Monitoring</td>
</tr>
<tr>
<td></td>
<td>11/16/19,</td>
<td>increased mid-month for fence construction.</td>
</tr>
<tr>
<td></td>
<td>11/18/19 - 11/22/19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11/27/19</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>12/2/19 - 12/6/2019</td>
<td>The pair was observed perching and adding nest materials to the new Stearns</td>
</tr>
<tr>
<td></td>
<td>12/9/19 - 12/13/19,</td>
<td>Perch F nest location, as well as night roosting and occasional day use of</td>
</tr>
<tr>
<td></td>
<td>12/16/19 - 12/18/19</td>
<td>the perch near the Del Corso Park nest tree. Monitoring increased for fence</td>
</tr>
<tr>
<td></td>
<td>12/20/19, 12/24/19</td>
<td>construction.</td>
</tr>
</tbody>
</table>
Figure 4. Timeline of events during the 2018 and 2019 nesting seasons.

- **Egg Laying/Incubation**
- **Brooding/Caring for young in nest**
- **Fledging**
- **Post fledge Dependent on nest**
- **Post fledge/Dispersal**
- **Courtship/Nest construction**

Legend: 2018 (green), 2019 (brown)
References


