US Department of Transportation
Federal Aviation Administration
Great Lakes Region
Chicago Airports District Office

DRAFT BIOLOGICAL ASSESSMENT FOR THE RUSTY PATCHED BUMBLE BEE

for Midfield Cargo Development

at the

Chicago Rockford International Airport

Rockford, Winnebago County, Illinois

April 2022

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1 PROJECT DESCRIPTION

1.1 LOCATION

The Rockford International Airport (RFD) is located in northern Illinois in the southern part of Winnebago County (Township 43N, Range 1E, Section 22). RFD encompasses over 3,000 acres and is generally bound by Illinois State Route 251 to the east, the Kishwaukee River to the south, the Rock River to the west, and U.S. 20 to the north. The Sponsor's Proposed Action, as approved in a 2019 Environmental Assessment, included development of the Midfield Cargo Area, located south of Runway 7/25, west of Runway 1/19, and north of Cessna Drive and Beltline Road, and development of the Northwest Air Cargo Area located north of Runway 7/25, shown on Figure 1.

FIGURE 1 – 2019 ENVIRONMENTAL ASSESSMENT SPONSOR'S PROPOSED ACTION

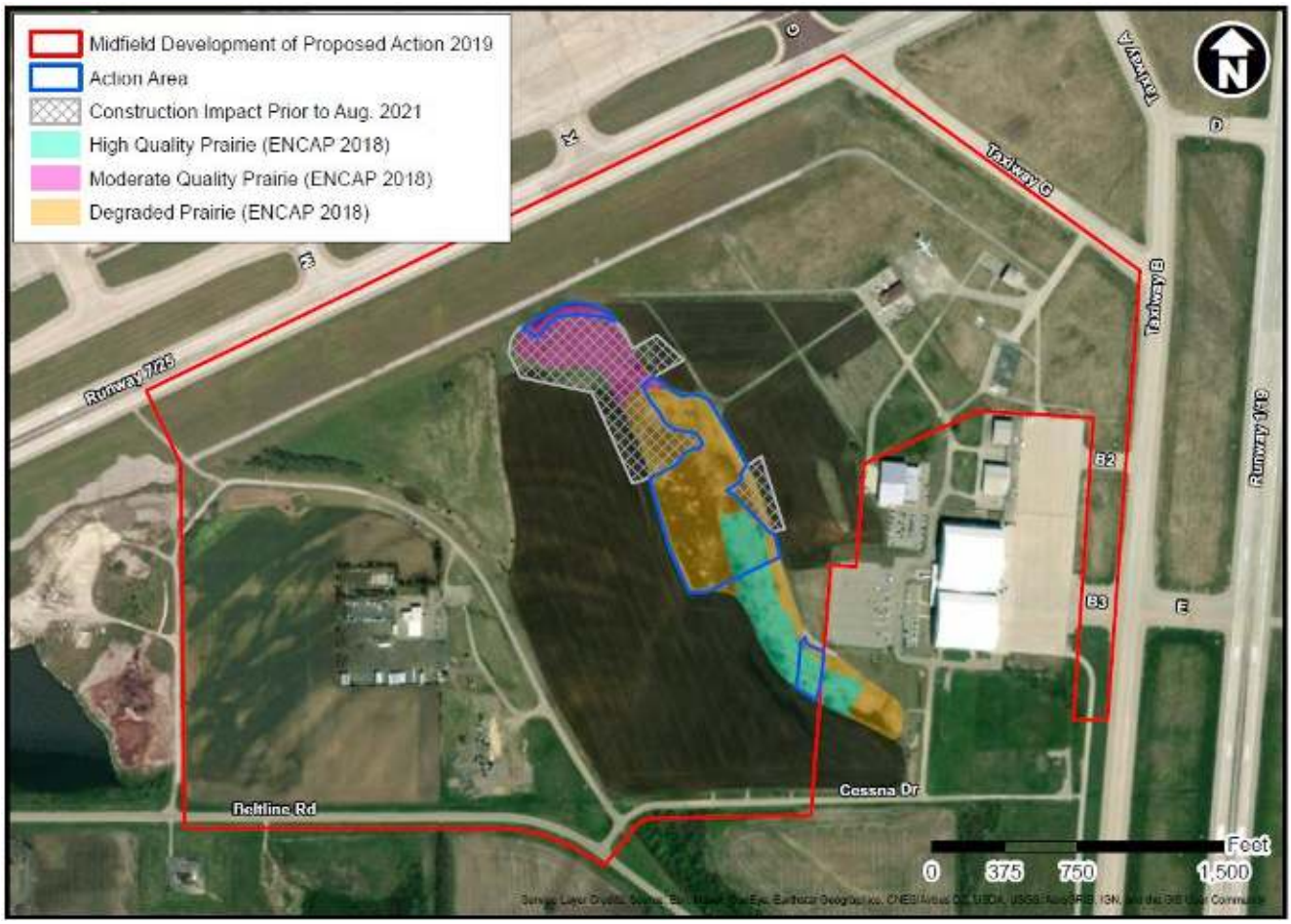
Existing land use within the project area is currently zoned industrial. The 2019 Environmental Assessment noted that the northern, northeastern, and a small portion in the southwest of the Midfield Cargo project area are developed with impervious surfaces and mowed turf, while the remainder of the project area is undeveloped with farmland and a prairie area, identified as Bell Bowl Prairie, an Illinois Natural Areas Inventory site.

Additional location mapping is provided in Appendix A.

1.2 DEFINITION OF ACTION AREA

The Action Area is a project area applicable to consultation under the Endangered Species Act. It is defined as all areas to be affected directly or indirectly by the FAA action and not merely the immediate area involved in the action (see 50 CFR § 402.02). The Action Area includes the proposed remaining development area within the prairie boundary in the Midfield Cargo Area part of the Sponsor's Proposed Action (Action), as shown in Figure 2.

FIGURE 2 – ACTION AREA



While the Northwest Air Cargo area and the non-prairie areas of the Midfield Cargo Area are part of the development area for the Sponsor's Proposed Action, these areas were either disturbed or routinely mowed before and/or after construction was approved in the 2019 Environmental Assessment and Finding of No Significant Impact (FAA, 2019) and do not contain habitat for any documented listed species. A portion of the prairie was already impacted by approved construction prior to August 2021, when construction was halted to reinitiate agency consultation, described further in Section 1.3. Therefore, these areas of prior disturbance and lack of habitat are not included in the Action Area for this Biological Assessment. Photos of the remaining prairie habitat are provided in Appendix B.

1.3 ACTION

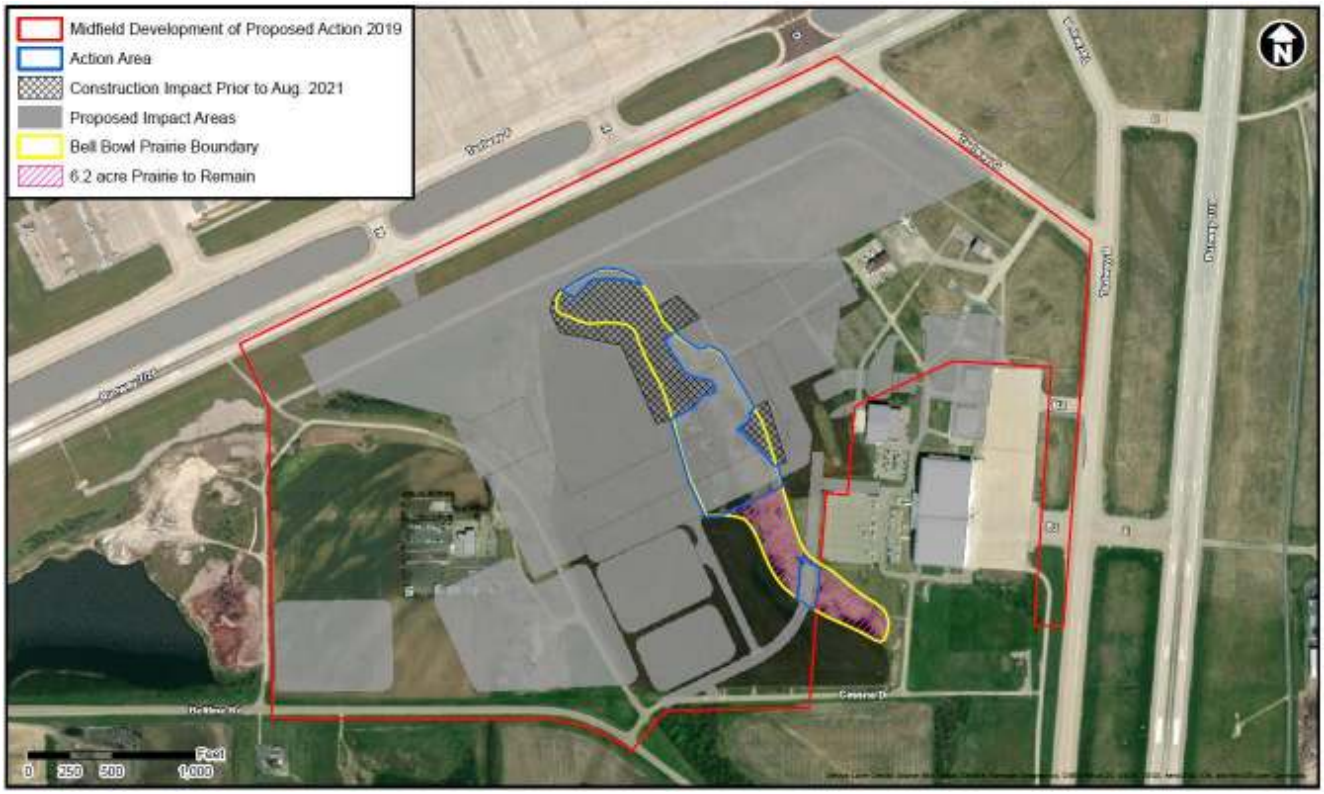
Based on the 2019 EA, Greater Rockford Airport Authority (GRAA) proposed to construct approximately 280 acres of new air cargo facilities and associated infrastructure within the Midfield Cargo Area of the Sponsor's Proposed Action. Midfield Cargo Area project improvements include:

- Construction, lighting and marking partial parallel taxiway to Runway 7/25
- Construction, lighting and marking of midfield air cargo apron to accommodate up to 12 wide-body aircraft parking positions
- Construction of new approximately 1 million square foot air cargo building
- Construction of new ground support equipment and maintenance buildings with covered storage and equipment staging area
- Construction, lighting and marking of proposed truck dock and approximately 14-acre truck parking area
- Constructing, lighting and marking of approximately 16-acre employee parking lot
- Construction of new truck and employee entrance/access roads connecting to Beltline Road, including associated intersection improvements
- Construction of new service/access roads, grading, drainage and utility extensions/improvements
- Construction of new detention areas to accommodate additional impervious surfaces, and security and wildlife fencing modifications and installation.

Within the Action Area, development will include construction of a new access road, a parallel taxiway, aircraft parking and air cargo facilities. The Action exhibit is provided in Figure 3. The full size exhibits are provided in Appendix A.

As noted in the 2019 EA, no wetlands or other regulated surface waters will be impacted by the project. A portion of the Action Area is located within the 100-year floodplain of the Kishwaukee River. A Master Drainage Study was completed and included a proposed conditions hydraulic analysis to evaluate the floodplain and floodway boundaries based on the proposed development conditions and to determine the potential change in upstream or downstream flooding. As an outcome of the Master Drainage Study, the Federal Emergency Management Administration (FEMA) issued a Conditional Letter of Map Revision (CLOMR) for the proposed project, including a change in the floodplain boundary. A copy of the CLOMR and associated correspondence can be found in the Final Environmental Assessment (FAA 2019) for the project.

FIGURE 3 –ACTION EXHIBIT



After approval of the 2019 Environmental Assessment, construction of the project began in Fall 2020. Approximately 6.2 acres (2.6 acres degraded, 3.6 acres moderate and 0 acre high quality) of the prairie was disturbed prior to August 2021 for grading and excavation of detention basins and other air cargo facility infrastructure associated with the Action.

Construction was halted in the prairie in August 2021 when a record of two rusty patched bumble bees was reported within Bell Bowl Prairie (see record of occurrence in Appendix C). Construction within the Action Area is expected to resume in summer 2022 and be complete by fall 2024, pending consultation status.

Within the Action Area, the Action would permanently impact a total of 9.3 acres (7 acres degraded, 0.7 acre moderate and 1.7 acres high) of the remaining 15.5-acre (9.7 acres degraded, 0.6 acre moderate and 5.2 acres high quality) prairie. The Action includes retention of 6.2 acres (2.6 acres degraded, 0 acre moderate and 3.6 acres high quality) of prairie.

1.4 EXISTING CONDITIONS

The Midfield Cargo Development area has several existing facilities that constrain the location of the cargo development and access road. East of the Midfield Cargo Development area is a large aircraft maintenance, repair and overhaul (MRO) facility, the Rock Valley College aviation career education center, and multiple cargo handling facilities. The existing MRO parking lot accommodates approximately 400 parking spaces. Setback requirements in accordance with FAA (Part 77 and Advisory Circulars) for the Runway Visibility Range (RVR) system limit non-aeronautical development to the north. The existing airfield and taxiways are located to the north. To the west there is an existing cargo facility and offsite remote truck lot that provides 102 truck spaces. To the south are the existing Cessna Drive and Beltline Road and agricultural land. The Rockford Solar Energy Project solar array is located on the south side of Beltline Road.

The existing Midfield Cargo Development area has a two lane access road with four, ninety degree turns. A portion of access road is a remnant of a township roadway, and it was not designed to safely accommodate a high volume of semi-truck operations.

1.5 ROADWAY DESIGN CRITERIA

The engineering design criteria applicable to the proposed midfield access road include the *City of Rockford, Illinois USA Engineering Design Criteria (September 2019)* and the *Illinois Department of Transportation Bureau of Local Roads and Streets (BLRS) Manual (December 2018)*. These criteria are applicable to the airport roadways since RFD is located within the City of Rockford and would utilize funds through Illinois Depart of Transportation (IDOT) Division of Aeronautics.

Based on FAA Order 5100.38D, Change 1 (FAA Airport Improvement Handbook) and the IDOT BLRS manual, all new construction is based on a 20 year minimum useful life. Therefore, 20 years was used for the design criteria and for the safety modeling of the improvement.

Design Speed – The standard speed limit within the City of Rockford is 30 miles per hour which is the minimum design speed allowed by IDOT Bureau of Local Roads design requirements for this roadway classification.

Geometric Design – As the midfield access road is expected to be a high traffic, low speed roadway, the horizontal alignment design is required to follow the BLRS Manual Section 29-4 Horizontal Alignment (Low-Speed Urban Streets). The maximum superelevation is 2% for this roadway. The geometric design criteria shall follow Section 32-2 Geometric Design Criteria. The IDOT BLRS Manual recommends avoidance of minimum radii and maximum superelevation, especially in areas subject to ice and snow. The City of Rockford, Illinois averages 35 inches of snow per year.

1.6 PURPOSE AND NEED

The 2019 EA indicated the purpose of the Sponsor's Proposed Action was to provide airfield and landside improvements that could accommodate growth in cargo operations by existing carriers and support the addition of new cargo operations and service by new carriers at RFD. The need for the Sponsor's Proposed Action was to address the limited available apron and air cargo facilities required to accommodate the existing and projected air cargo activity at RFD.

Due to the special purpose law impacts identified and discussed in this BA, avoidance and minimization alternatives were evaluated.

1.7 ALTERNATIVES

Alternatives were evaluated for the Action to minimize or avoid impacts to the prairie, which provides suitable habitat for the rusty patched bumble bee. Full size exhibits for the alternatives are provided in Appendix A. A summary of the alternatives is provided on Table 1 on page 14.

NO ACTION ALTERNATIVE

The No Action Alternative would involve no construction or disturbance activities within the Action Area. No impacts to the remaining prairie would occur. This alternative does not meet the purpose and need to provide the aircraft parking and air cargo facilities to accommodate the existing and projected air cargo activity at RFD.

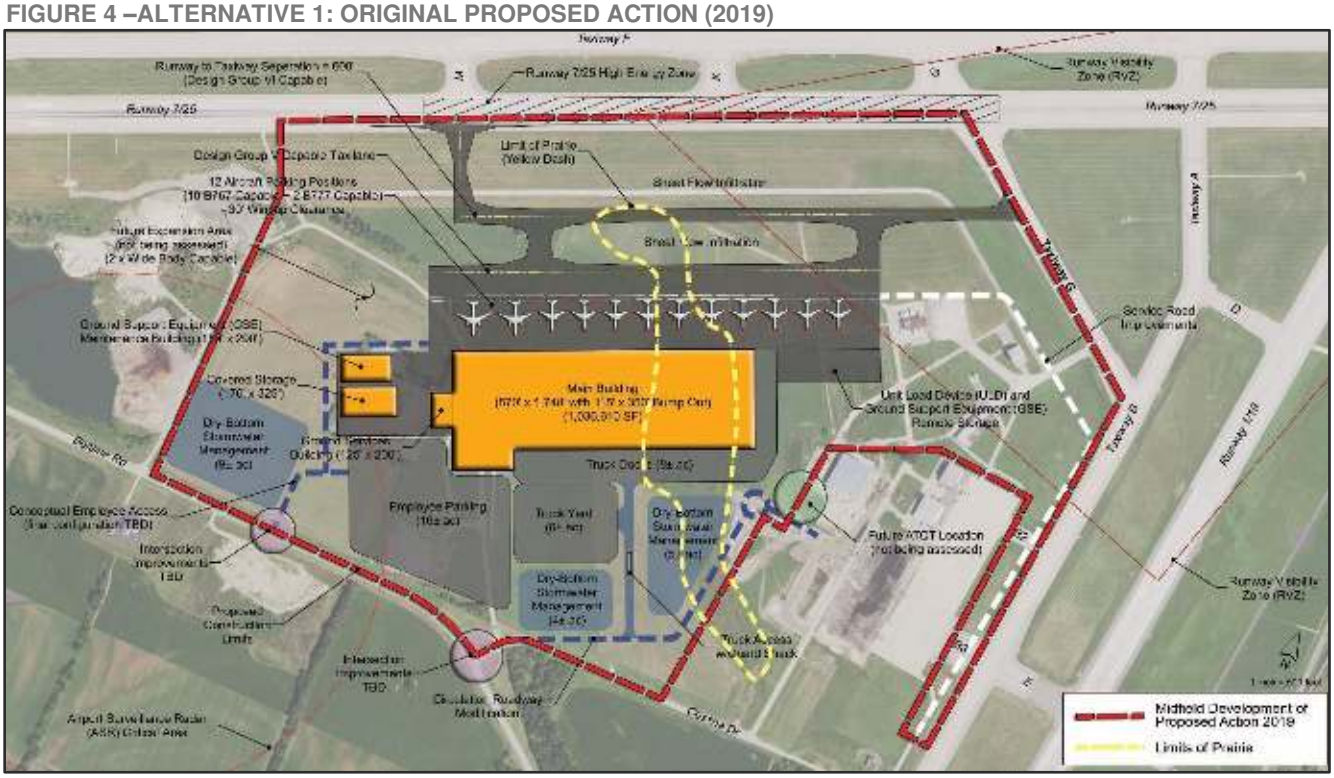
ALTERNATIVE 1: ORIGINAL ACTION (2019)

The original action would construct the new midfield entrance road, cargo buildings, cargo aprons, parking areas and an extension of Taxiway P. It would also include the placement of a detention basin in the central area of the prairie.

The construction of this alternative would impact 13.2 acres of prairie remaining after August 2021 (8.2 acres degraded, 0.7 acre moderate and 4.3 acres high quality) to construct the aircraft parking and air cargo facilities, access road and stormwater detention facilities. This alternative includes the retention of 2.4 acres of prairie, including 0.9 acres of high quality prairie and 1.5 acres of degraded prairie.

This alternative would meet the purpose and need. However, due to the greater magnitude of impact on the prairie, this alternative was not selected.

FIGURE 4 –ALTERNATIVE 1: ORIGINAL PROPOSED ACTION (2019)



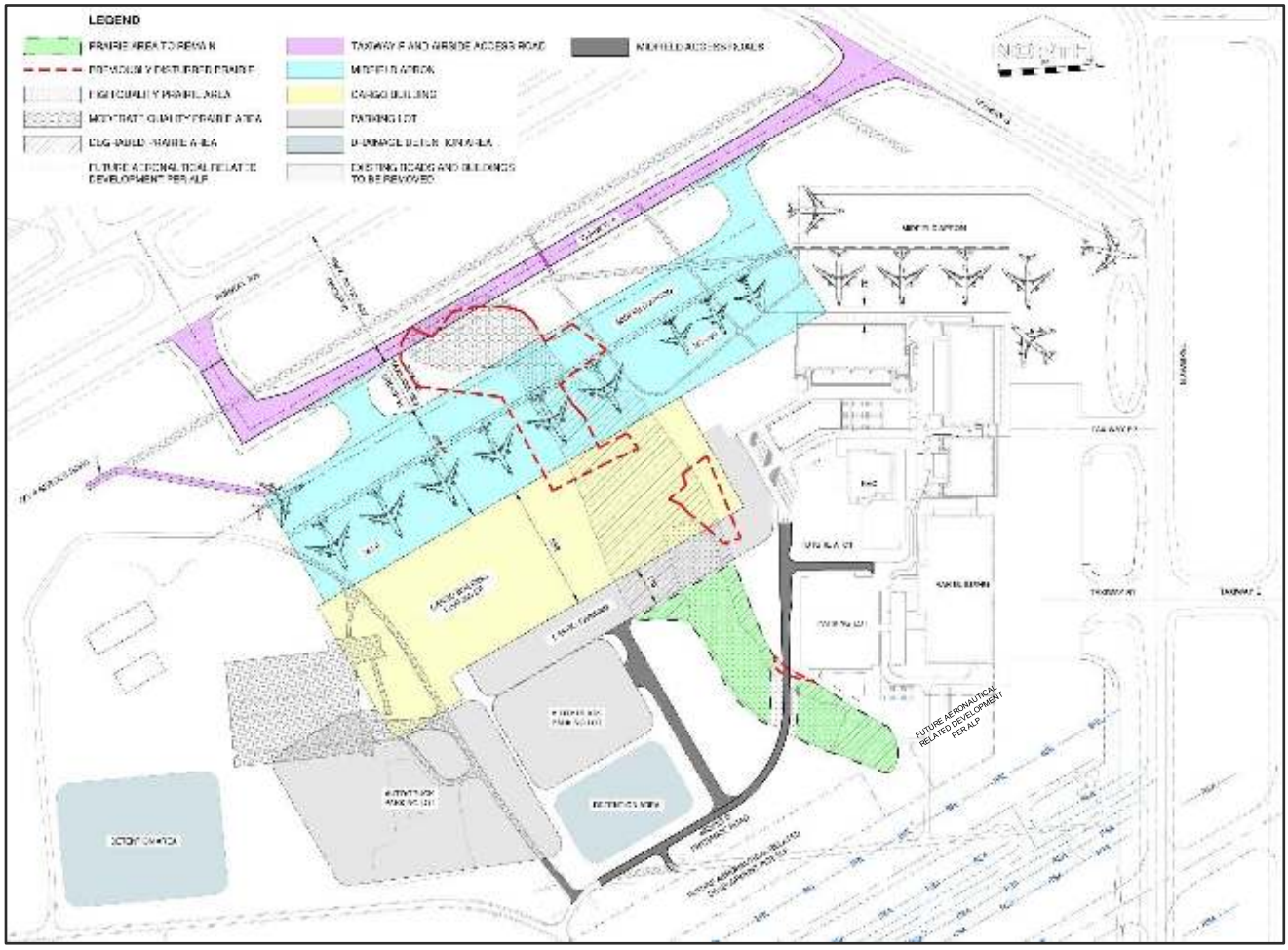
ALTERNATIVE 2: ACTION

The Action would construct the new midfield entrance road, cargo buildings, cargo aprons, parking areas and an extension of Taxiway P (see Figure 4). This alternative is similar to Alternative 1, but would reduce the total impact to 9.3 acres of prairie remaining after August 2021 (7 acres degraded, 0.7 acres moderate and 1.7 acres high quality) by removing a previously planned stormwater detention facility (which would reduce the prairie impacts by 3.9 acres). This alternative includes the retention of 6.2 acres of prairie, including 3.6 acres of high quality prairie and 2.6 acres of degraded prairie.

The roadway geometry provides a safe access road design for the expected large semi-truck vehicles used to transport air cargo to and from the airport. The safety performance evaluated using IHSDM

indicated that this roadway alignment would be expected to result in approximately 5.6 crashes within the 20 year design horizon (see Appendix D).

FIGURE 5 –ALTERNATIVE 2: ACTION (PREFERRED ALTERNATIVE)



This alternative provides the following benefits over the other identified alternatives:

- Meets the purpose and need by providing the airfield and landside improvements that would accommodate the forecast air cargo operations
- Safer roadway alignment than Alternatives 3, 4 and 5
- Reduces the impact on the prairie habitat due to the removal of the stormwater detention basin that was planned under Alternative 1

Therefore, this alternative is the preferred alternative.

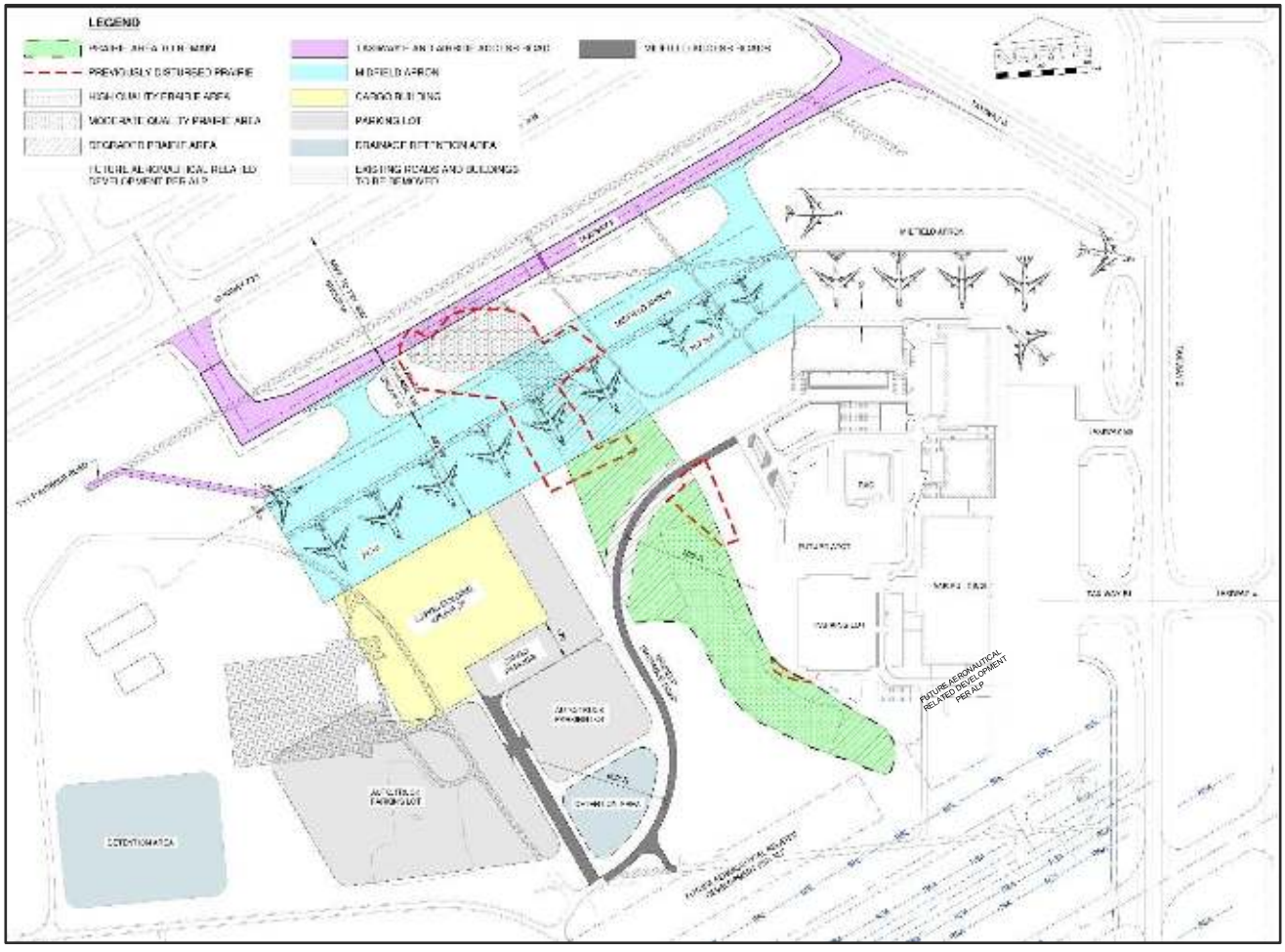
ALTERNATIVE 3: NORTHERN ACCESS ROAD ALIGNMENT

This alternative includes a revised new midfield access road from the existing Cessna Drive to the north end of the new cargo building complex. The roadway alignment consists of two horizontal curves which impacts areas more to the north of the quadrant to access the Midfield Cargo Development area, and includes 600' radius horizontal curves. This alternative also includes removing a previously planned stormwater detention facility and a portion of the cargo building (which would reduce the prairie impacts by 9.6 acres). This alternative would require reducing the size of the cargo building from approximately 1 million square feet to 475,000 square feet due to the revised roadway alignment. Therefore, this alternative would not fully meet the project purpose and need due to the inability to provide the 1 million square foot cargo building to support the forecasted air cargo volume.

The safety performance evaluated using IHSDM indicated that this roadway alignment would be expected to result in approximately 8.4 crashes within the 20 year design horizon (see Appendix D).

This alternative would result in a total impact of 3.6 acres of prairie remaining after August 2021 (2.9 acres degraded, 0.7 acre moderate and 0 acre high quality) and would include the retention of 11.8 acres of prairie, including 5.2 acres of high quality prairie and 6.6 acres of degraded prairie. This alternative would not meet the purpose and need due to the reduced building volume, and therefore was not selected.

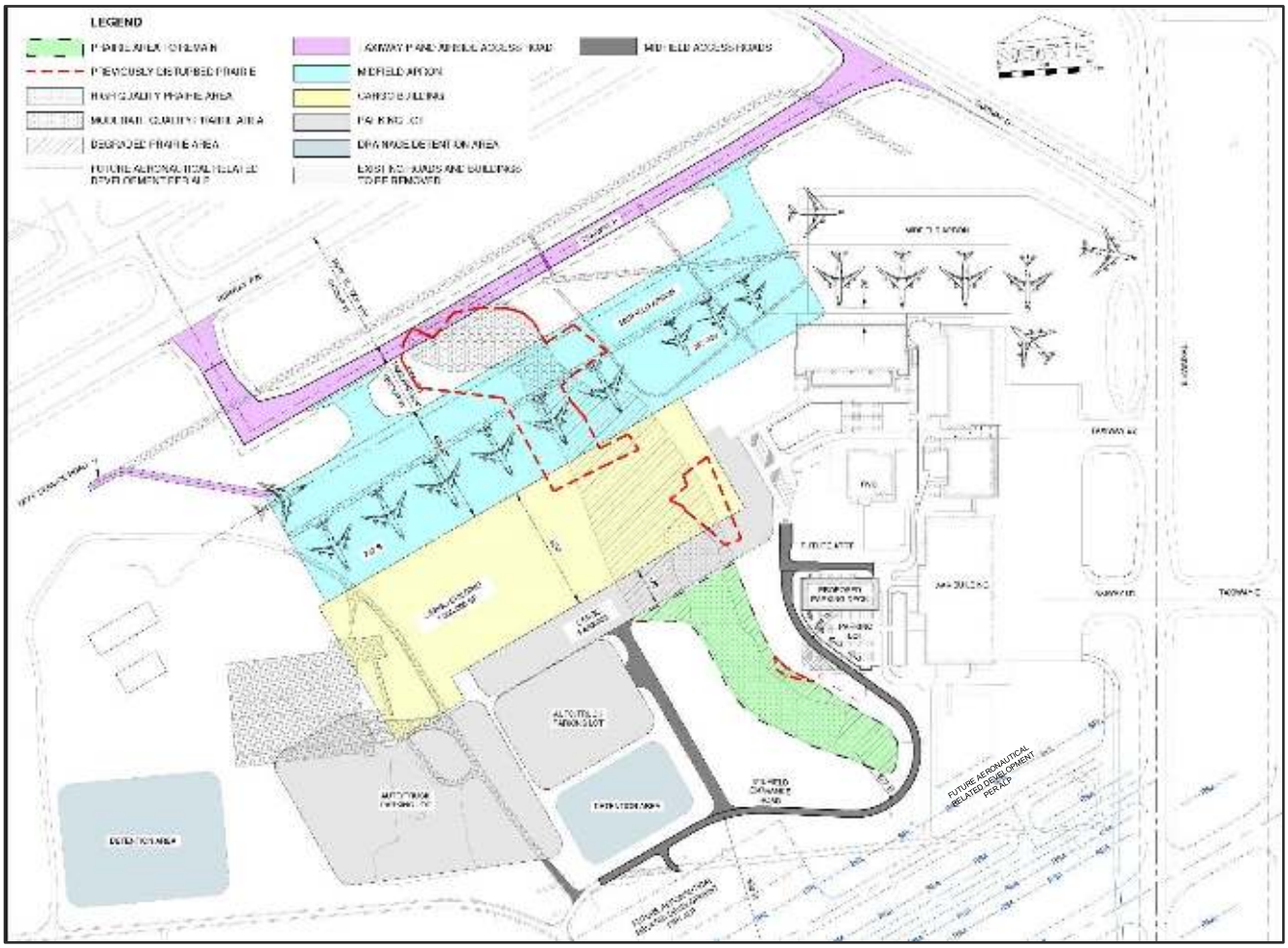
FIGURE 6 – ALTERNATIVE 3: NORTHERN ACCESS ROAD ALIGNMENT



ALTERNATIVE 4: EASTERN ACCESS ROAD ALIGNMENT

Alternative 4 includes a new midfield access road from the existing Cessna Drive with a curve to the eastern edge of the existing prairie area. This alternative provides a less efficient access to the Midfield Cargo Development area. The alignment requires a series of reverse curves, starting with a 600' radius curve, followed by a 361' tangent section leading into a 273' radius curve, exiting to a 366' tangent section into 408' radius curve to avoid the prairie on the east end. The central curve of 273' is at the minimum radii and the alignment requires the use of maximum superelevation to accommodate the geometric alignment. The IDOT BLRS Design Manual recommends avoidance of minimum radii and maximum superelevation especially in areas subject to ice and snow. The City of Rockford, Illinois averages 35 inches of snow per year.

FIGURE 7 – ALTERNATIVE 4: EASTERN ACCESS ROAD ALIGNMENT



The addition of curves in the road results in a less safe roadway compared to the Action. The safety performance evaluated using IHSDM indicated that this roadway alignment would be expected to result in approximately 14 crashes within the 20 year design horizon (see Appendix D).

This alternative would also impact the existing utilities, including watermain, ComEd electric and Nicor gas, the existing detention basin located south of the MRO building and approximately 100 spaces currently serving the existing MRO facility.

This alternative would impact 8.7 acres of prairie remaining after August 2021 (1.1 acres of high quality, 0.7 acre moderate and 6.9 acres degraded prairie) and would include the retention of 6.7 acres of prairie, including 4 acres of high quality prairie and 2.7 acres of degraded prairie.

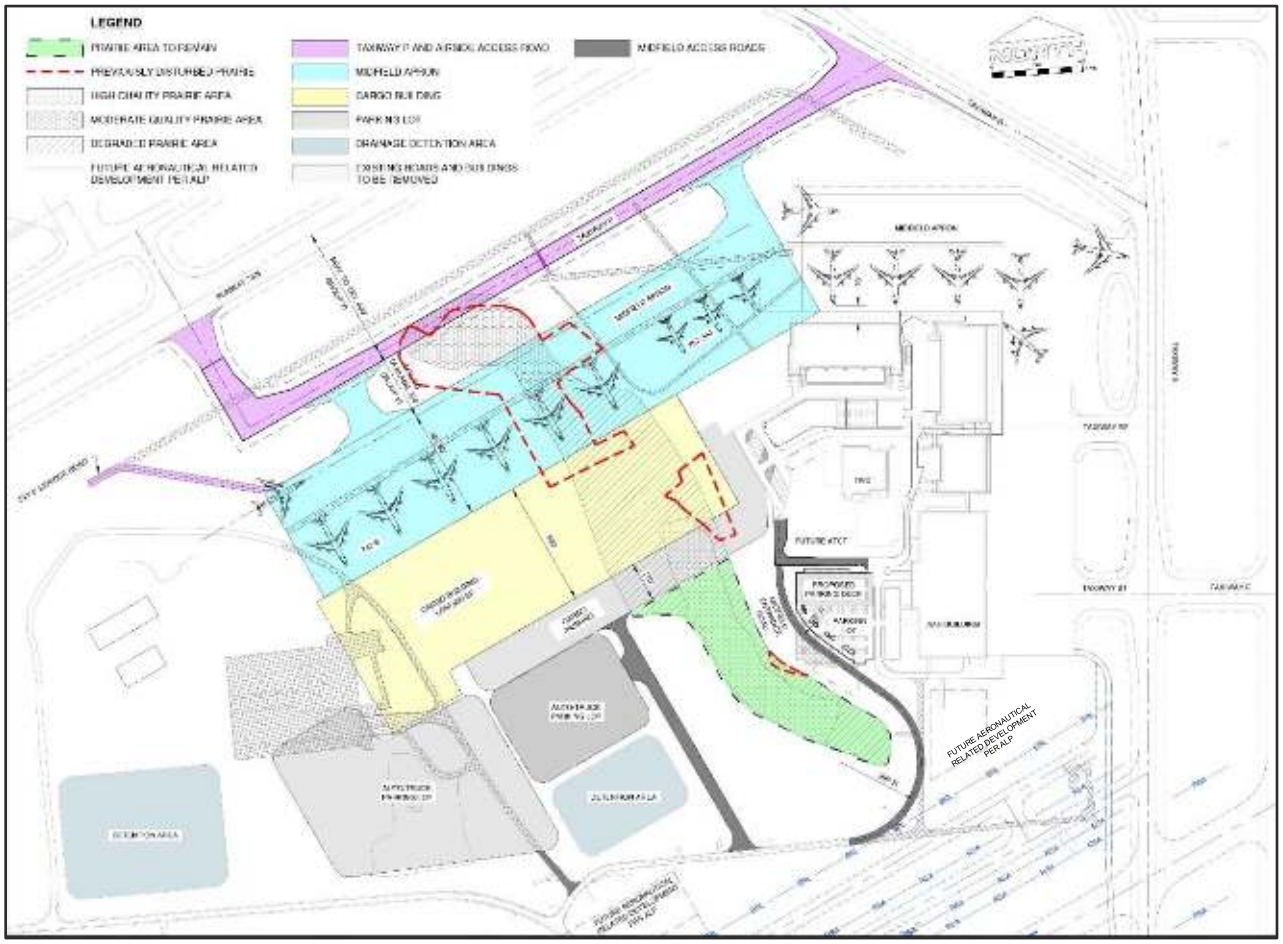
This alternative meets the purpose and need. Due to the decreased safety performance of the roadway and the use of the minimum radii and maximum superelevation, which are not recommended by the IDOT BLRS Design Manual, this alternative is not prudent and was not selected.

ALTERNATIVE 5: SOUTHEASTERN ACCESS ROAD ALIGNMENT

Under this alternative, the southern termination point would connect to the existing roadway at a location that utilizes more of the existing roadway. The vertical grade differences dictate the connection point to maintain a feasible longitudinal grade to accommodate truck traffic. The alignment still requires a reverse curve but will eliminate the one of the three curves used in Alternative 4. The second curve would have a radius of 355' and would require the use of maximum superelevation to accommodate the geometric alignment. The IDOT BLRS Design Manual recommends avoidance of maximum superelevation in areas subject to ice and snow. The City of Rockford, Illinois averages 35 inches of snow per year.

The addition of curves results in a less safe roadway compared to the Action. The safety performance evaluated using IHSDM indicated that this roadway alignment would be expected to result in approximately 15.7 crashes within the 20 year design horizon (see Appendix D).

FIGURE 8 – ALTERNATIVE 5: SOUTHEASTERN ACCESS ROAD ALIGNMENT



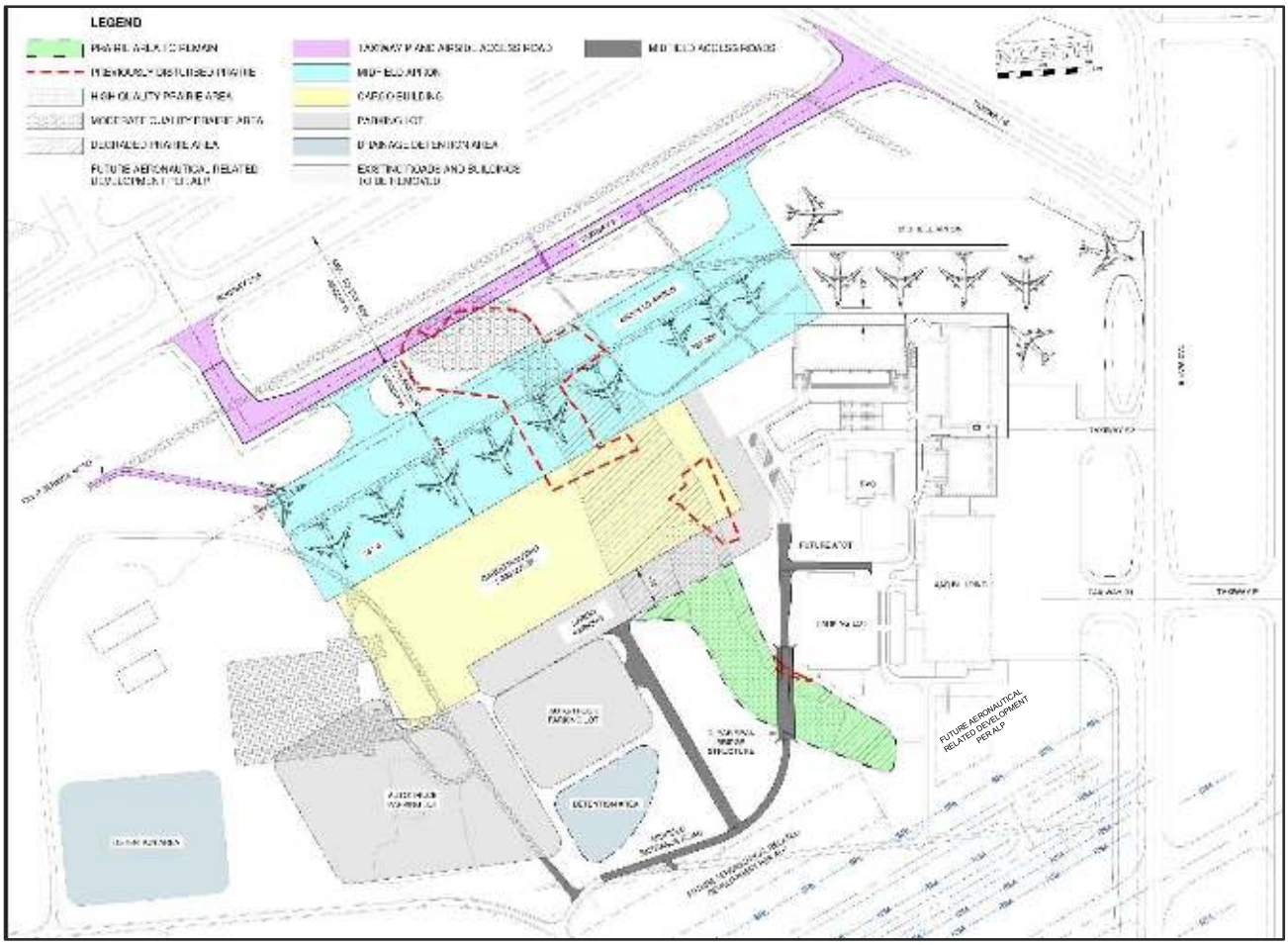
Similar to Alternative 4, implementation of this alternative would also impact the utilities and MRO facility parking lot. This alternative would impact 8.7 acres of prairie (1.1 acres high quality, 0.7 acres moderate and 6.9 acres degraded prairie) and would include the retention of 6.7 acres of prairie, including and 4 acres of high quality prairie and 2.7 acres of degraded prairie.

This alternative meets the project purpose and need. Due to the decreased safety performance of the roadway and the use of the maximum superelevation, which is not recommended by the IDOT BLRS Design Manual, this alternative is not prudent and was not selected.

ALTERNATIVE 6: BRIDGE ALIGNMENT

This roadway design utilizes the preferred roadway alignment from Cessna Road to the primary Cargo Building complex but utilizes a bridge over the existing prairie area to avoid direct destruction of the prairie substrate from the placement of the roadway. The concept would entail a one-span bridge over the entire prairie resulting in a span length of approximately 280 feet. To span this distance, a steel girder would need to be approximately 10 feet tall. The roadway profile would need to be raised approximately 15 to 20 feet to create space between the bottom of the bridge girder and the existing ground. Significant embankment fill would be needed on each end of the bridge to create the profile needed at the bridge while also providing a reasonable longitudinal grade for trucks to

FIGURE 9 – ALTERNATIVE 6: BRIDGE ALIGNMENT



climb the hill. The safety performance evaluated using IHSDM indicated that this roadway alignment would be expected to result in approximately 7.5 crashes within the 20 year design horizon (see Appendix D).

This alternative would result in a total of 8.7 acres of direct prairie impact (1.1 acres high quality, 0.7 moderate quality and 6.9 acres degraded) and would include the retention of 6.7 acres of prairie, including 4 acres of high quality and 2.7 acres of degraded prairie. While the prairie substrate would not directly be impacted by the bridge, shading of the prairie would likely impact the ability of the vegetation to thrive and would limit the prairie function and values for the 0.7 acres underneath the bridge, resulting in an indirect impact of 0.7 acres. Since this alternative only provides the benefit of 0.7 acres of direct impact on the prairie substrate, but would provide a less safe roadway, this alternative is not prudent and was not selected.

ALTERNATIVE EVALUATION SUMMARY

As shown in Table 1 below and discussed in the preceding sections, the Action would reduce the impact to the prairie remaining after August 2021, meet the purpose, and need and would provide the safest midfield access road performance of the alternatives evaluated.

TABLE 1: ALTERNATIVES SUMMARY

Evaluation Factor	No Action	Alt 1: Original Action (2019)	Alt 2: Action	Alt 3: Northern Alignment	Alt 4: Eastern Alignment	Alt 5: Southeastern Alignment	Alt 6: Bridge Alignment
Meets Purpose and Need	No	Yes	Yes	No	Yes	Yes	Yes
Prairie Impact	0 acres	13.2 acres	9.3 acres	3.6 acres	8.7 acres	8.7 acres	8.7 acres direct 0.7 acres indirect
Prairie Retention	15.5 acres	2.4 acres	6.2 acres	11.8 acres	6.7 acres	6.7 acres	6.7 acres
Midfield Entrance Road Safety							
Crashes per 20 Year Design Horizon	47.6	5.6	5.6	8.4	14	15.7	7.5
Conforms to IDOT BLRS Recommendations for Roadway Radius and Superelevation*	NA	Yes	Yes	Yes	No	No	Yes

*The Illinois Department of Transportation Bureau of Local Roads and Streets Design Manual recommends avoidance of minimum curve radii and maximum superelevation in areas subject to ice and snow. The City of Rockford, Illinois averages 35 inches of snow per year.

2 DESCRIPTION OF THE ACTION AREA SPECIES AND THEIR HABITAT

According to the Information for Planning and Consultation (IPaC) web application maintained by the U.S. Fish and Wildlife Service (USFWS), the Action Area is within the range of the following federally listed species: Indiana bat (*Myotis sodalis*; endangered), Northern long-eared bat (*Myotis septentrionalis*; threatened), Hine's emerald dragonfly (*Somatochlora hineana*; endangered), eastern prairie fringed orchid (*Platanthera leucophaea*; threatened), and prairie bush clover (*Lespedeza leptostachya*; threatened). Although the rusty patched bumble bee (*Bombus affinis*; endangered) is not listed on the IPaC official species list for the Action Area, an occurrence of the rusty patched bumble bee was reported within the prairie on August 8, 2021; therefore, the rusty patched bumble bee was included in this Biological Assessment. The IPaC official species list dated December 20, 2021, is provided in Appendix C.

Habitat types within the Action Area include Grade C and D dry gravel prairie (known as Bell Bowl Prairie, an Illinois Natural Areas Inventory Site) (IDNR 2021), as well as scrub/shrub early successional habitat (CMT 2021). Approximately 1.7 acres of high-quality prairie, 0.7 acres of moderate quality prairie, and 7 acres of degraded prairie are located within the Action Area. Approximately 6.5 acres of the 7 acres of degraded prairie is comprised of scrub/shrub early successional habitat due to woody encroachment. Approximately 6.2 acres of degraded (2.6 acres) and high (3.6 acres) quality prairie located outside of the Action Area would be retained as part of the Action. The Habitat Assessment Report is provided in Appendix B.

2.1 SPECIES WITH A DETERMINATION OF NO EFFECT

The Action will have no effect on five species based on the lack of species records within the Action Area, the lack of suitable habitat, and the results of field habitat assessments. Information supporting the determination for each species or species group is summarized further below.

2.1.1 INDIANA BAT (*MYOTIS SODALIS*) AND NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

The Indiana bat, belonging to the genus *Myotis*, is a medium-sized bat with a body length of 1.5 to 2 inches and a wingspan of 9 to 11 inches and fur coloration of dark-brown to black (USFWS 2006). The species is similar in appearance to other related species but can be distinguished by comparing characteristics such as the structure of the foot and color variations in the fur (USFWS 2006). Indiana bats utilize caves or occasionally abandoned mines, known as hibernacula, during winter hibernation. During the summer, the bats roost singly or in colonies under loose tree bark and in cavities or crevices of live and dead or dying trees (USFWS 2006).

The Northern long-eared bat, belonging to the genus *Myotis*, is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches, with fur coloration of medium to dark brown on the back and tawny to pale-brown on the underside (USFWS 2015). The species is distinguished by its long ears, especially compared to other bats in its genus. Northern long-eared bats utilize caves and mines, known as hibernacula, during winter hibernation. During the summer, the bats roost singly or in colonies under tree bark and in cavities or crevices of live and snag trees that are equal to or greater than three inches diameter at breast height (dbh) (USFWS 2015).

No trees providing appropriate roosting habitat are present within the Action Area for either bat species. Therefore, no effect to the Indiana bat or Northern long-eared bat is expected.

2.1.2 HINE'S EMERALD DRAGONFLY (*SOMATOCHLORA HINEANA*)

The Hine's emerald dragonfly is a flying insect belonging to the order Odonata. The species has emerald-green eyes and a dark brown and metallic green body with yellow stripes on its sides (USFWS 2006). The body is 2.5 inches long with a wingspan of 3.3 inches (USFWS 2006). The dragonfly lives in calcareous spring-fed marshes and sedge meadows overlaying dolomite bedrock (USFWS 2006).

No calcareous wetland habitat, including spring-fed marshes or sedge meadows, is present within the Action Area. Therefore, no effect to the Hine's emerald dragonfly is expected.

2.1.3 EASTERN PRAIRIE FRINGED ORCHID (*PLATANTHERA LEUCOPHAEA*)

The eastern prairie fringed orchid is a perennial herb that grows from underground tuber and requires full sun for optimum growth and flowering and a grassy habitat with little to no woody encroachment (USFWS 1999, USFWS 2005). The species is 8 to 40 inches tall and has an upright leafy stem; 3- to-8-inch lance-shaped laves sheath the stem. Each plant has a single flower spike of 5 to 40 creamy white flowers; each flower has a three-part fringed lip less than 1 inch long (USFWS 2005). The orchid occurs in a variety of habitats, including mesic prairie to wetlands, such as sedge meadows, marsh edges and bogs.

No mesic prairie is present within the Action Area; however, a farmed wetland and two non-farmed emergent wetlands are present outside of the Action Area within the Action. The wetlands are low-quality and do not have Coefficient of Conservatism values (C-values) or Floristic Quality Index (FQI) values that met the requirements established by the USFWS for habitat quality of the orchid (ENCAP 2018; USFWS 2019); therefore, further surveys for the orchid were not necessary. None of these wetlands will be impacted by the Action (FAA 2019). Additionally, previous plant inventories by Applied Ecological Services, ENCAP, and IDNR did not identify the eastern prairie fringed orchid on site or in the prairie during the species' flowering period (Appendix B), and the USFWS has no previous records of this species on site. Therefore, this species is likely not present, and no effect to the eastern prairie fringed orchid is expected.

2.1.4 PRAIRIE BUSH CLOVER (*LESPEDEZA LEPTOSTACHYA*)

The prairie bush clover is a member of the bean family and is endemic to the tallgrass prairie region of the upper Mississippi River Valley region in Iowa, Illinois, Minnesota and Wisconsin (USFWS 2009). The plant has slender clover-like leaves comprised of three leaflets about an inch long and quarter inch wide. Flowering plants are generally between 9 and 18 inches tall with flowers loosely arranged on an open spike. Flowers are pale pink or cream colored and bloom in mid-July; the plant has a grayish-silver sheen (USFWS 2009). The species prefers dry to mesic prairies with gravelly soils (USFWS 2009). Prairie bush clover is found in gravelly or sandy hillside prairies. Associated species include big bluestem (*Andropogon gerardii*), side oats grama (*Bouteloua curtipendula*), round-headed bush clover (*Lespedeza capitata*), Canada bluegrass (*Poa compressa*), and smooth brome (*Bromus inermis*) (Wilhelm et al. 2017).

Appropriate habitat for the prairie bush clover is present within the Action Area, and many associate species were identified on site, including big bluestem (*Andropogon gerardii*), side oats grama (*Bouteloua curtipendula*), round headed bush clover (*Lespedeza capitata*), and smooth brome (*Bromus inermis*) (CMT 2021).

Many individuals of round headed bush clover were observed throughout the Action Area. The individuals had senesced and were dry; however, seed heads were still apparent. Two individuals that

exhibited *Lespedeza* characteristics were observed in the field; at the time of the site visit, positive species confirmation was uncertain, and photo documentation of the individuals was recorded for further examination and expert consultation (photos located in Appendix B). After consultation with botanists and species experts, it was determined that these individuals were likely more degraded round headed bush clover individuals from either earlier in the season or from the prior year, as the individuals had similar stipules, branching pattern, and coloration. Additionally, the inflorescence structure and shoot appeared too robust, and the stem was too branched compared to prairie bush clover (see report in Appendix B).

No individuals of prairie bush clover or individuals exhibiting characteristics of prairie bush clover were observed in the Action Area. Given that the previous plant inventories by Applied Ecological Services, ENCAP, and IDNR did not identify the prairie bush clover on site during the species' flowering period (Appendix B), and the USFWS has no previous records of this species on site, this species is likely not present; therefore, no effect to the prairie bush clover is expected.

2.2 RUSTY PATCHED BUMBLEBEE (*BOMBUS AFFINIS*)

2.2.1 DESCRIPTION OF SPECIES AND GENERAL HABITAT REQUIREMENTS

The rusty patched bumble bee is a species of bumble bee native to eastern North America, belonging to the genus *Bombus* within the family Apidae. While all individuals have entirely black heads, the species is distinguished by a small rust-colored patch on the middle of workers' and males' second abdominal segment (USWS 2016, Xerces 2019). Queens are the largest sized bees in the colony, while workers are the smallest (USFWS 2016).

Rusty patched bumble bees live in colonies, which experience an annual cycle (USFWS 2016). A solitary queen locates a suitable nest site in spring, where she lays and fertilizes eggs. Workers hatch from the first eggs and collect food, defend the colony and care for the young, while the colony grows, and the queen continues laying eggs. New queens and males hatch in late summer, and males disperse to mate with new queens. The queen dies at the end of the season, and only new queens go into diapause over the winter, emerging in the spring to repeat the cycle.

2.2.2 FORAGING HABITAT REQUIREMENTS

The rusty patched bumble bee prefers to forage in any open, vegetated habitat, such as prairies, roadsides, meadows, and woodlands that contain nectar and pollen sources that are nearby their colony nest sites (USFWS 2016). While bumble bees can survive on low diversity of floral resources, high floral resource diversity increases the opportunities for bumble bees to forage on multiple pollen sources over a longer period which may decrease nutritional stress, thereby supporting bumble bee populations through its positive effects on colony establishment and brood production (Goodell et al. 2019; Watrous et al. 2019; Mola et al. 2021; USFWS 2021).

Early natural history surveys suggest rusty patched bumble bee queens use a range of woody and nonwoody species early in the season, while gynes foraging later in the season were found on floral genera primarily associated with open habitats, suggesting the importance of forests as forage habitat declines as the season progresses (Mola et al. 2021).

2.2.3 NESTING HABITAT REQUIREMENTS

Bumble bee nests are typically located in abandoned rodent nests or other similar underground cavities (Liczner and Colla 2019; Goodell and Lanterman 2019). Bumble bees appear to prefer nesting in sites with greater floral abundance and soil conditions that correspond to increased bare ground, lower soil moisture and warmer soil temperatures (Buckles and Harmon-Threatt 2019). Sloped ground and soil compaction appear to be the most predictive nesting resources for bumble bee species, with preferences of ground-nesting bees for softer, less compacted soils and sloped ground (Sardiñas and Kremen 2014).

Workers may forage up to about 1 km from nests (USFWS 2021). Amongst bumble bee species, underground nests were the most commonly observed, often in abandoned small mammal burrows (Liczner and Colla 2019; Goodell et al. 2019), typically one to four feet underground, but may also select nest sites at ground level in grass tussocks (Goodell et al. 2019). The rusty patched bumble bee is unlikely to nest in areas of standing water or high-water table, paved areas, areas of annual row crops, forests with invasive shrub understory, or frequently mowed areas. A recent study described three rusty patched bumble bee nests (Boone et al. 2022). Two of the nests were located in residential yards in primarily developed residential/commercial areas, one in an abandoned rodent burrow and the other between a building's foundation and insulation. The third nest was in a county park undergoing active restoration on site. The nest was situated in a wooded area dominated by common buckthorn (*Rhamnus cathartica*). These observations suggest that the rusty patched bumble bee may be tolerant of urban and degraded habitats.

The rusty patched bumble bee's active flight season is typically from mid-March through mid-October (USFWS 2021). Because the availability of forage resources influences nest density and colony survival, bumble bees may choose nesting sites near areas where spring forage is available to optimize their energy intake during foraging trips (Liczner and Colla 2019; USFWS 2021). The species is expected to prefer nesting sites with abundant floral resources in April/May through August and is typically associated with grassland-type habitat, as well as wooded areas, urban parks, and gardens (Goodell et al. 2019). Forests and forest edges are common sites of nesting for many bumble bee species, and, based on community science and anecdotal observations, it is likely that nesting and overwintering habitat for rusty patched bumble bee is favorable within forested landscapes (Mola et al. 2021).

2.2.4 OVERWINTERING HABITAT REQUIREMENTS

Little is known about overwintering preferences of bumble bees, including the rusty patched bumble bee (Liczner and Colla 2019; Williams et al. 2019; Goodell et al. 2019). Generally, overwintering bumble bee queens are most often observed in shaded areas, usually near trees and in banks without dense vegetation and are most often found in north-facing slopes; however, they may also be found in slopes facing other directions (Liczner and Colla 2019). Soil type is often described as sandy well-drained or loose, and queens appear to avoid areas with dense vegetation, preferring to overwinter in undisturbed bare-earth, moss, under tree litter, or in bare-patches within short grass (Liczner and Colla 2019; Goodell et al. 2019). The same overwintering site may be used repeatedly (Liczner and Colla 2019). Additionally, new common eastern bumble bee (*Bombus impatiens*) queens are known to scatter widely in search of overwintering sites (Szabo and Pengelly 1973).

Overwintering habitat use is from mid-October through mid-March (Goodell et al. 2019). Based on knowledge of other bumble bee species' overwintering preferences, the overwintering sites of the rusty patched bumble bee are expected to be in uncompacted and often sandy, well-drained or loose soils on northwest exposures. It is hypothesized that queens prefer overwintering on north-facing slopes to prevent emerging too early in the winter on a warm day. Queens may overwinter in woodland areas

near early blooming spring ephemeral resources (USFWS 2016; Xerces 2019; Mola et al. 2021). Woodland areas are thought to provide thermoregulation for overwintering queens and shelter from the cold from September/October through March/April, where they can avoid premature warming in March (Goodell et al. 2019). The relationship of temperature and emergence has been shown to be highly significant, as emergence is a physical response to increasing temperatures (Szabo and Pengelly 1973).

Williams et al. (2019) recorded the first data on the overwintering habitat for any western North American bumble bee. Their study suggests that overwintering, nesting, and foraging habitats are likely distinct, and that queens' selection of overwintering sites may be shaped by environmental stressors of the year. Western bumble bee queens were found overwintering in litter beneath cypress trees in mineral soils where no floral resources existed, within short distances of tree trunks and shaded from direct sun, which were similar to British species found to be overwintering beneath trees (Williams et al. 2019). While limited overwintering habitat data is recorded for other ground nesting bumble bee species, it is reasonable to consider that the same overwintering habitat distinction holds true for rusty patched bumble bee. Plath (1927) notes that buff-tailed bumble bee (*Bombus terrestris*) prefers to burrow in ground under trees and that it seems probable that queens of other species belonging to the Terrestris group, including rusty patched bumble bee, would hibernate in a similar setting. The only known record of an overwintering rusty patched bumble bee was found in a maple-oak woodland in Wisconsin in 2016 (USFWS 2021), suggesting that this species likely typically overwinters in deciduous woodland habitat.

2.2.5 RELATIONSHIP OF HABITAT IN ACTION AREA TO LOCAL POPULATIONS

Based on known typical foraging distances and dispersal movements of other bumble bee species, the rusty patched bumble bee may forage up to 1 km (0.6 mile) from the colony, and new queens may disperse up to 10 km (6 miles) (Goodell et al. 2019; USFWS 2021).

The Action Area is currently located within a USFWS designated primary dispersal zone (an area where the species is not likely to be present but surrounds a high potential zone (an area identified as having high potential for the species to be present; HPZ)) for the rusty patched bumble bee. On August 8, 2021, it was reported that two rusty patched bumble bees were seen within the prairie (see Appendix B). Based on photos provided, the USFWS confirmed the bees' species. Due to this sighting, the USFWS HPZ model may be updated by USFWS in the future. Five other HPZs for the rusty patched bumble bee are located within a 10 km radius of the Action Area.

Based on the presence of floral resources within the Action Area and proximity of the Action Area to other HPZs for the rusty patched bumble bee, it would be possible for rusty patched bumble bees to be found utilizing habitat within the Action Area at some point during the flight season. As the Action Area is within the forage and queen dispersal radius of confirmed HPZs for the rusty patched bumble bee and provides appropriate foraging and nesting habitat, it can be presumed that individuals may utilize the Action Area for food and nesting. Observed habitat for the rusty patched bumble bee within the Action Area is detailed below.

Within 10 km of the Action Area, approximately 1,438 acres of potential foraging habitat, approximately 1,185 acres of potential foraging-nesting habitat, and approximately 5,342 acres of potential nesting-overwintering habitat is available to the rusty patched bumble bee. Of that, approximately 7.7 acres of potential foraging, 6 acres of potential foraging-nesting and 0.9 acre of potential nesting-overwintering habitat are available within 1 km of the Action Area.

Potential foraging, nesting, and overwintering habitats were inferred via currently available satellite imagery, NLDS landcover data, FEMA floodplain data, and National Wetlands Inventory data to determine potential rusty patched bumble bee habitat types at a macroscale level. Potential foraging habitat was classified by the inferred presence of grasslands/prairies, wetlands, wooded areas, and suburban/urban gardens that may provide floral resources. Potential nesting habitat was classified by the inferred presence of grassland-type or wooded habitat that is not located within wetlands or floodplains. Potential overwintering habitat was classified by the inferred presence of wooded areas not located within wetlands or floodplains. It is important to note that inferred potential habitat areas outside of the Action Area have not been verified in the field. Habitat proximity mapping is provided in Appendix A.

2.2.6 SPECIES INFORMATION IN ACTION AREA

Due to the reported sighting of two rusty patched bumble bees within the prairie in August 2021, the Action Area is treated for impact analysis as if it is within a USFWS designated HPZ for the rusty patched bumble bee.

The Rusty Patched Bumble Bee (*Bombus affinis*) Interagency Cooperation under Section 7(a)(2) of the Endangered Species Act Voluntary Implementation Guidance, dated November 2021, and the Xerces Society Rusty Patched Bumble Bee Habitat Assessment Form and Guide (Xerces 2017) were used by CMT biologists to guide habitat survey requirements for the species. Appropriate habitat for the rusty patched bumble bee was assessed throughout the limits of the prairie within the Action Area. Evaluation of habitat for the bee was assessed by determining available habitat types throughout the Action Area. Dominant vegetation, soil types, soil saturation and surrounding available habitat were noted.

Appropriate habitat for the rusty patched bumble bee was identified in the prairie located within the Action Area (see Appendix B). Habitat is generally absent outside of the prairie, other than low-quality foraging resources that may be present at certain times within the mowed turf grass, agricultural fields planted with soybean (*Glycine max*) and alfalfa (*Medicago sativa*), and three low-quality wetlands (ENCAP 2018). The wetlands will not be impacted by Action.

The Xerces Society Rusty Patched Bumble Bee Habitat Assessment Form was completed for the existing conditions of the prairie (Xerces 2017). The current conditions' overall score was 118 out of a maximum score of 215, suggesting moderate habitat availability for the species.

Good-quality foraging habitat for the rusty patched bumble bee is present throughout the Action Area, as the prairie plant community is fairly diverse and provides forage that would be available during the long active season from mid-March into October. Portions of the foraging habitat areas are experiencing woody encroachment; however, the encroachment is not yet dense enough to inhibit the growth of some floral resources.

Previous plant inventories have identified at least twelve species of flowering plants that are considered favored floral resources by the rusty patched bumble bee, per the USFWS Midwest Plant Guide and The Xerces Society, including:

- *Amorpha canescens* (superfood plant)
- *Asclepias spp.*
- *Cirsium discolor* (superfood plant)
- *Dalea purpurea* (superfood plant)
- *Gentiana spp.*
- *Monarda fistulosa* (superfood and immune building plant)
- *Penstemon digitalis* (immune building plant)
- *Prunus spp.*
- *Ribes spp.*
- *Rosa spp.*
- *Salix spp.*
- *Solidago spp.* (superfood plant)

One additional plant species, sunflowers (*Helianthus spp.*), identified on site is also noted by The Xerces Society as an immune building species, but is not listed on the USFWS Midwest Plant Guide. Based on the Xerces Society form, the existing foraging habitat scored 27 out of 50.

The prairie is comprised of generally dry and loose, unconsolidated soil, which is preferred by the bee for nesting. Additionally, numerous small mammal burrows were located within the prairie, which may also be utilized by the bee for nesting. The bee would be expected to potentially nest on the slope of the prairie but would likely not nest at the base of the prairie where there is scrub/shrub and/or possible soil saturation within the designated floodplain. Within the degraded prairie area, vegetation tussocks and mounds were present and may provide additional nesting habitat. Based on the Xerces Society form, the existing nesting and overwintering habitat scored 18 out of 30.

The Xerces Society form combines nesting and overwintering habitat. However, the site scored 0 for both areas of site with woody cover where bees could build a nest or overwinter (due to thick scrub/shrub areas on site and lack of woodland forest habitat) and for leaf litter left on site for overwintering queens (due to the lack of a duff layer). Based on the USFWS Rusty Patched Bumble Bee Section 7 Guidance, and information presented in scientific literature regarding known and presumed bumble bee habitat preferences, the lack of deciduous forest habitat and north/northwest-facing slopes suggests that appropriate overwintering habitat for the rusty patched bumble bee is not present in the Action Area (USFWS 2021; Liczner and Colla 2019; Goodell et al 2019; Szabo and Pengelly 1973; Williams et al. 2019; Plath 1927).

2.2.7 DESIGNATED OR PROPOSED CRITICAL HABITAT

No designated or proposed critical habitats are located within the Action Area (USFWS 2021).

3 ENVIRONMENTAL BASELINE

Populations of rusty patched bumble bee are experiencing drastic large-scale declines nationwide, despite having been historically widespread and common (Colla and Packer 2008, Grixti et al. 2009, Cameron et al. 2011, Colla et al. 2012). In a study assessing declines of North American *Bombus* species using historical and recent collection records, the rusty patched bumble bee has been noted as persisting in less than 50% of its re-sampled historical range, indicating a substantial population decline, most likely within the past decade (Colla et al. 2012).

Half of the bumble bee species found historically in Illinois have been either locally extirpated or have shown declines in distribution, including the rusty patched bumble bee, which has shown a decline in its distribution over time in Illinois (Grixti et al. 2009). The decline of bumble bee richness in Illinois occurred primarily between 1940 and 1960, coinciding with major agricultural intensification in the Midwest, including conversion of diverse crops and pastures containing a variety of floral resources to large-scale corn and soybean fields (Grixti et al. 2009). A study conducted in Britain found similar results, indicating that the large-scale decline in native and long-established plant species as forage resources have likely impacted the fitness of individual bumblebee colonies within each season, as well as the persistence of populations between years (Carvell et al. 2006). While the rusty patched bumble bee is experiencing decline throughout Illinois, observed bumble bee diversity has been found to be highest in the northern portion of the state where conservation efforts would likely be most productive (Grixti et al. 2009).

Bumblebees are more vulnerable to extinction than other animal taxa. Their long colony cycles with production of reproductive individuals occurring primarily toward the end of the colony cycle has implications for their ability to tolerate slight changes in resource acquisition and likely results in large cumulative impacts on colony development and reproductive success (Colla and Packer 2008). Additionally, their life cycle requires three types of habitats for foraging, nesting and hibernating in close proximity to each other. Declines in bumblebee populations may also be attributed to extensive use of novel pesticides, habitat loss due to intensive agriculture and urbanization, and pathogen spillover from commercial bees (Colla and Packer 2008). Declining *Bombus* populations appear to have significantly higher infection levels of the microsporidian pathogen *Nosema bombi* and lower genetic diversity compared with co-occurring populations of stable species, which may be contributing to some bumblebee species decline (Cameron et al. 2011).

The remnant dry gravel prairie, described as one of the few remaining and best-preserved dry gravel prairie communities in Illinois (Egbert and Fell 1958; IDNR 2021), has likely been disturbed or impacted at various times throughout modern history, including during the site's use as Camp Grant from 1917 to 1946. The prairie and natural "bowl" amphitheater at the northwest end of the prairie was used throughout Camp Grant's history as a training site and gathering place. The site was transferred to the GRAA and converted to the RFD in 1946, and the prairie has largely been preserved since then. The site's native mean C-value and native FQI indicate a high-quality plant community (ENCAP 2018).

A 4.88-acre portion of the prairie was dedicated as a Category I (high quality natural community) INAI site by the IDNR, generally corresponding to the ENCAP-assessed high-quality portion of the site (ENCAP 2018; IDNR 2021). Approximately 1.9 acres (38%) of the INAI site is located within the Action Area. The GRAA owns and manages the property the prairie is located within. The northern portion of the prairie within the amphitheater "bowl" area had been consistently mowed by RFD since the mid-1990s (ENCAP 2018); this area has since been impacted by construction activities that were approved in the 2019 FONSI and occurred before the August 2021 siting. (CMT 2021). There is no evidence of

recent land management activities occurring on the prairie in at least the past ten years, based on the presence of significant woody encroachment in the prairie.

The Action Area includes 9.3 acres of prairie and has appropriate foraging and nesting habitat for the rusty patched bumble bee. Approximately 6.5 acres of the prairie within the Action Area is transitioning to early successional habitat due to woody scrub/shrub encroachment (CMT 2021). As discussed above, the prairie's current condition overall rusty patched bumble bee habitat score was 118 out of a maximum score of 215, suggesting moderate habitat is currently available for the species (CMT 2021).

As indicated previously, the following rusty patched bumble bee habitat types are available within the 10 km dispersal zone for new queens from the Action Area:

- Approximately 1,438 acres of potential foraging habitat
- Approximately 1,185 acres of potential foraging-nesting habitat
- Approximately 5,342 acres of potential nesting-overwintering habitat

The adjacent area surrounding the prairie has been partially developed for airport operations, with runways located approximately 430 feet to the north, taxiways located approximately 2,000 feet to the east, cargo buildings and parking lots located approximately 142 feet to the southeast. Adjacent land to the west and southwest is primarily used as agricultural/open fallow fields with soybean (*Glycine max*) and alfalfa (*Medicago sativa*). Access roads are located 96 feet to the east and 247 feet to the south of the southeast end of the prairie. Construction activities approved in 2019 and initiated in 2020 impacted the northern portion of the prairie outside of the Action Area and adjacent agriculture fields to the west and north until construction stopped August 2021. Mapping depicting the original and remaining prairie boundary, area of the previously approved construction disturbance, and habitat within the Action Area are provided in the Habitat Assessment Report located in Appendix B.

The existence of the prairie has likely sustained the presence of suitable habitat for the rusty patched bumble bee, as well as maintained the potential for a local resident bee population within the Action Area. Furthermore, the presence of existing habitat within 10 km of the Action Area in designated natural areas, agricultural areas, and gardens have likely contributed to the persistence of the species within the northern Illinois region.

4 EFFECTS OF THE ACTION

This section discusses the direct, indirect and cumulative effects of the Action on the rusty patched bumble bee (*Bombus affinis*), which is the only federally-listed species identified as being affected by the Action.

4.1 DIRECT EFFECTS

Direct effects are those effects caused by the Action that occur at the time of the action. Potential direct effects of the Action on the rusty patched bumble bee could include direct construction related effects and modification of potential foraging, nesting, and overwintering habitat. Direct effects to the species could also include, but are not limited to, harm or harassment of an individual bee(s) due to adverse contact with construction equipment or personnel. The following potential stressors caused by the Action that could affect the rusty patched bumble bee have been identified: loss of habitat, direct contact with construction equipment and/or personnel, and hazardous material and chemical spills.

4.1.1 LOSS OF HABITAT

Approximately 9.3 acres of existing potential foraging habitat and 4.6 acres of existing potential nesting habitat would be permanently lost as a result of the Action. Construction of an access road, aircraft parking, and air cargo facilities in the Action Area will result in permanent conversion of foraging and nesting habitat to mowed turf-grass with compacted soil and an impermeable asphalt surface devoid of pollen and nectar resources.

There will be a partial loss of bunching grasses that supports suitable nesting habitat, which will result in a partial loss of potential nesting sites in proximity to summer foraging areas within the Action Area. Loss of nesting sites in close proximity to floral resources may result in avoidance of the area, deterioration in bumble bee body condition, and reduction in reproductive output due to the need to find appropriate nesting habitat elsewhere (USFWS 2021). Because nesting density within the Action Area has not been determined, the benefit of the doubt is given to the species and low to high (14-45 nests/km^2 (0.14-0.45 nests/hectare)) nest density estimates are considered (USFWS 2021). Based on this density assumption and the presence of 4.6 acres (1.86 hectare) of nesting habitat within the Action Area, 0.26-0.84 nests (i.e. 1 nest) could be present within the Action Area during any given nesting season and could potentially be impacted by the Action.

The Action would also directly reduce a portion of available nectar plant density for the rusty patched bumble bee. Reduction or elimination of nectar plant density or diversity may result in the bee's inability to find suitable amounts of nectar and pollen which may cause avoidance of the area, potential deterioration of body condition, and reduced or no reproductive output for affected queens (USFWS 2021). This could increase mortality of immature life stages that would be present in nests at the time of the action (whether the nest is located on or off site) or reduce overwinter survival of queens. The USFWS indicates that when foraging resources are removed or reduced in more than 5% of the area within 200 meters of a nest, adverse effects are likely to begin to accrue to the colony (USFWS 2021). Of the 15.5 acre remaining existing prairie, 9.3 acres (60%) would be impacted by the Action within the Action Area. If the bee is presumed to be nesting within the prairie, then the Action would result in substantially more than 5% of available foraging resources to be removed within 200 meters of a potential nest, which may result in adverse effects to the rusty patched bumble bee.

Approximately 4.3 acres of suitable nesting habitat will remain within the 6.2 acre remaining prairie, with all of the acreage being suitable for foraging. The 6.2 acre remaining prairie will not be temporarily or permanently impacted by the Action or disturbed by construction equipment. The predicted overall rusty patched bumble bee habitat score after project completion would be 96 out of 215 for this area, a 22-point reduction from the current conditions score (CMT 2021). The 6.2 acre area of the prairie to remain after the Action is shown on Figure 9.

4.1.2 DIRECT CONTACT WITH CONSTRUCTION EQUIPMENT AND/OR PERSONNEL

Construction activities have the potential to harm or harass the rusty patched bumble bee if individuals are present within or enter the Action Area during construction. Bees could come into direct contact with construction equipment and/or personnel. It is presumed that foraging/flying individuals would be able to readily escape construction activities. Construction related disturbances such as increased vibration levels could result in alteration of normal foraging and nesting behavior. Ground disturbance or compaction could also result in immediate death or harm of individuals present in nests.

The USFWS (2021) indicates that the effects of ground disturbance that affects more than 0.25 acre of nesting habitat within an HPZ when the species is present may not be discountable. Therefore, the GRAA has intentionally agreed to only conduct ground disturbing activities within the Action Area before the rusty patched bumble bee's flight season and nesting season. That way, any construction activities would avoid direct disturbance of nesting individuals. As a result, there would be low risk.

Because overwintering habitat is not present within the Action Area, the species is not expected to be present on site prior to overwintering emergence and the start of the flight season.

4.1.3 HAZARDOUS MATERIAL AND CHEMICAL SPILLS

Hazardous materials and chemicals in the form of gasoline, engine oil, lubricants or other fluids used during construction activities could be unintentionally released or spilled due to seepage or accidental spills. Rusty patched bumble bee individuals may come into contact with these materials if they are searching for nectar and pollen resources within the Action Area, which may increase physiological stress and/or cause direct mortality. Accidental release of hazardous materials into the environment may potentially impact growth of floral resources for the bee in the immediate vicinity of the Action Area.

Direct impact to the rusty patched bumble bee from hazardous materials and chemicals could occur as the bee is searching for nectar or pollen during construction. Additional measures will be taken to protect the 6.2 acre remaining prairie after the Action from any potential release of hazardous materials (see conservation measures in Section 5.1 below).

FIGURE 9 – 6.2 ACRE REMAINING PRAIRIE

4.2 INDIRECT EFFECTS

Indirect effects are those effects that are caused by or will result from the Action but occur later in time and are still reasonably certain to occur. The following potential indirect stressors caused by the Action that could affect the rusty patched bumble bee have been identified: direct contact with vehicles, and chemical applications.

4.2.1 DIRECT CONTACT WITH VEHICLES

Accidental or intentional strikes by vehicles utilizing the adjacent access road bisecting the 6.2 acre remaining prairie after the Action to rusty patched bumble bee individuals may result in harm or harassment to individuals. However, vehicle strikes are presumed to be a minor effect. The set speed limit of the access road will be 30 mph, and as a highly mobile species, the bee is likely to adjust its flight path to avoid colliding with a vehicle.

4.2.2 CHEMICAL APPLICATIONS

Herbicide use in areas where floral resources are present could reduce availability of nectar and pollen, resulting in nutritional stress that leads to increased susceptibility to pathogens or direct mortality (USFWS 2021). Any application of herbicide or pesticide for management of adjacent mowed turf-grass after project completion may harm or cause mortality to the rusty patched bumble bee if individuals come into contact with the chemical substances. However, indirect effects to the species by chemical applications is considered to be low risk because no herbicides or pesticides will be used on the 6.2 acre remaining prairie after the Action unless issued for selective spot-treatment of undesirable/invasive plants. A conservation measure will ensure no herbicides or pesticides will be used in the mowed areas adjacent to the 6.2 acre remaining prairie (see conservation measures in Section 5.1).

4.3 CUMULATIVE EFFECTS

Cumulative effects, as defined by 50 CFR § 402.02, include the effects of future state, tribal, local or private actions that are reasonably certain to occur within the Action Area. Future federal actions that are unrelated to this Action are not considered because they would be subject to separate consultation pursuant to Section 7 of the Endangered Species Act.

Broadly, urbanization and land development are known to cause habitat loss, fragmentation and degradation, which affects a variety of plant and animal species, including the rusty patched bumble bee. Habitats may also be lost or degraded as a result of associated activities, including road and utility construction and maintenance, housing development and agricultural expansion. Additional threats resulting from urbanization and land development include contamination, poisoning by pesticides and competition from more generalist-bee species that have not seen the same level of decline as the rusty patched bumble bee. Some of these activities may occur without consultation with or authorization by the USFWS pursuant to Section 7 of the Endangered Species Act, limiting consideration of development activities' impacts to federally-listed species.

Within and adjacent to the Action Area, no additional development is expected after project completion. Other airport projects that are reasonably expected to occur in the future would impact mowed turf grass areas and alfalfa fields that are not suitable habitat for the rusty patched bumble bee.

As there are five HPZs and a large amount of potential foraging, nesting, and overwintering habitats within 10 km of the Action Area (as described in section 2.2.5), and 6.2 acres of foraging and nesting habitat to be retained on site in the remaining prairie, the Action is not expected to significantly contribute to the cumulative effects that may impact the rusty patched bumble bee.

5 DETERMINATION OF EFFECT

Appropriate habitat for the Indiana bat (*M. sodalis*), Northern long-eared bat (*M. septentrionalis*), eastern prairie fringed orchid (*P. leucophaea*) and Hine's emerald dragonfly (*S. hineana*) were not identified within the Action Area. While appropriate habitat for the prairie bush clover (*L. leptostachya*) is present within the Action Area, no individuals have been observed within the Action Area either presently or historically. Therefore, we conclude that the Action will have no effect on these species.

Appropriate forage and nesting habitat for the rusty patched bumble bee (*B. affinis*) was identified within the Action Area. Because appropriate habitat is available, rusty patched bumble bees were documented foraging within the prairie in 2021, and multiple HPZs for the rusty patched bumble bee are located within 10 km of the Action Area, it is likely that the bee may forage and/or nest within the Action Area. The conservation measures proposed below in this Biological Assessment will minimize and limit the Action's effect on the species and its habitat.

Because the Action would result in 60% reduction of the available foraging habitat for the rusty patched bumble bee within the Action Area and within 200 meters of potential nests, we conclude that the Action may affect, and is likely to adversely affect the rusty patched bumble bee. However, considering the implementation of the conservation measures as identified below, the Action would not result in jeopardy to the continued existence or recovery of this species.

The Action is not likely to result in incidental take due to timing of the ground disturbance prior to the flight and nesting season and the lack of overwintering habitat present within the Action Area.

5.1 CONSERVATION MEASURES

The following conservation measures will be implemented to minimize the potential effects to the rusty patched bumble bee:

1. To avoid direct take during construction, ground disturbance activities within the Action Area will occur prior to March 15 the year of construction to prevent floral resources from blooming and nesting of the rusty patched bumble bee within the Action Area.

2. No construction parking or staging shall occur within the 6.2 acres prairie remaining after the Action.

3. Erosion control shall be implemented as specified in the Stormwater Pollution Prevention Plan.

4. The Action has been redesigned to avoid impact to 6.2 acres (3.6 acres high quality and 2.6 acres degraded) of existing Bell Bowl Prairie. The 6.2 acres will remain after the Action.

    a. To prohibit encroachment during construction, the 6.2 acre remaining prairie shall be demarcated by posted signs and temporary silt fence around the perimeter of the prairie during construction in the Action Area.

    b. No construction work or other disturbance shall occur within the 6.2 acre remaining prairie. All temporary sedimentation and erosion control and signs shall be removed when construction is complete.

5. Pesticide use will not be permitted within the 6.2 acre remaining prairie or in the adjacent mowed and hay field areas. All other measures should be used to remove undesired nonnative/invasive species.

6. GRAA evaluated opportunities for prairie restoration or creation on the airport to provide foraging and nesting habitat for the rusty patched bumble bee. A potential seed mix with species needed to support the rusty patched bumble bee and other state listed species that may occur in the prairie was provided to USDA Wildlife Services for their evaluation. In a memo dated February 24, 2022, USDA indicated that several of the proposed plant species needed to provide a similar habitat to Bell Bowl Prairie are potential hazardous wildlife attractants and they do not recommend the planting of those species on or near airport property. A copy of the potential seed mixes and the memo from USDA Wildlife Services are provided in Appendix C. Since on-site habitat enhancement or creation is not recommended on airport property, GRAA commits to completing one of the two conservation measures detailed below, dependent upon the outcome of partnership discussions.

    a. Option 1: GRAA will enter into an agreement with a conservation organization, such as the Forest Preserves of Winnebago County, to establish 52 acres of native pollinator habitat or natural areas within a rusty patched bumble bee high potential zone. This commitment will be conducted in a manner consistent with FAA guidelines regarding hazardous wildlife attractants and the Airport's Grant Assurances.

    b. Option 2: GRAA will allocate $150,000 to a third-party fiduciary account to serve as a conservation fund to be held until the identification of at least 52 acres suitable for prairie habitat restoration within a rusty patched bumble bee high potential zone is identified by a third party. The proposed monetary value was determined by evaluating the average cost of prairie and pollinator habitat seed mix for approximately 52 acres. The cost assumed planting would occur on public lands, such as Winnebago County Forest Preserve District property. The funds would be held in an interest-bearing account until an opportunity for habitat restoration and/or enhancement is offered or presented to the GRAA and USFWS.

REFERENCES

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Appendix A – Mapping and Exhibits

Appendix B – Data

Appendix C –Regulatory Coordination

Appendix D – Interactive Highway Design Model