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**Fall Wildlife Habitat Inventory  
in 08/09/10/11-29-20 W4M and 20/29-28-19 W4M  
Resiliency and Flood Mitigation Program**

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Submitted to:



Drumheller Resiliency and Flood Mitigation Office  
Drumheller, Alberta



SweetTech Engineering Consultants  
Calgary, Alberta

Submitted by:



Applied Aquatic Research Ltd.  
Calgary, Alberta

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# 1 INTRODUCTION

## 1.1 Project Overview

AAR Environmental Services\* (AARES – a Division of Applied Aquatic Research Ltd.) was retained by SweetTech Engineering Consultants (SweetTech) to complete an inventory of terrestrial habitat and its use by wildlife at five locations (Nacmine, North Drumheller, Rosedale, Hoodoo Trail and Wayne Valley) along the Red Deer River Valley near the Town of Drumheller, Alberta (Figures 1-4). This inventory is part of pre-construction planning for upcoming structural flood mitigation works proposed for each location. The works proposed include new dike construction, upgrades to existing dikes, new pedestrian bridge construction, and river bank erosion protection. A review of existing information was undertaken using available databases, followed by a field visit which consisted of a wildlife survey and habitat inventory at each of the locations.

# 2 APPROACH

## 2.1 Information Review

Available literature and databases were reviewed to understand wildlife use of habitat and presence of sensitive areas relative to the five areas affected by works proposed. Current regulations and guidelines pertaining to wildlife management in Alberta were also reviewed in detail. Key information sources included the following:

- Satellite and aerial imagery (Google 2020);
- The Natural Regions and Subregions of Alberta report (NRC 2006);
- Alberta provincial Sensitive Species Inventory Guidelines (GOA 2013);
- Historical wildlife records in Alberta (FWMIS [AEP 2020]);
- AEP wildlife sensitivity maps, including species ranges and key habitat zones (AEP 2020);
- Landscape Analysis Tool (LAT) [AEP 2020b]);
- Provincial land use guidelines pertaining to wildlife in the Grassland natural regions (GOA 2011); and
- Provincial and federal species conservation rankings (Species at Risk Act [GOC 2019], Committee on the Status of Endangered Wildlife in Canada [GOC 2019], Alberta Wildlife Act [GOA 2018], Alberta Wild Species General Status Listing [GOA 2017b]).

## 2.2 Supplemental Wildlife Field Work

A field crew comprised of a wildlife biologist and field assistant completed a ground-based wildlife sweep at each area from October 20<sup>th</sup> to 21<sup>st</sup>, 2020. Wayne Valley was not directly accessed due to landowner approval constraints at the time of on-site investigation. Information pertaining to this area was derived from the review of databases and professional experience. The purpose of fieldwork was to identify wildlife presence and habitat use within, and adjacent to, the proposed construction areas including those species with special conservation status and any important wildlife habitat and features (e.g., stick nest, dens, hibernacula sites, etc.). Feasible site-specific mitigation measures to avoid or reduce potential adverse effects on wildlife during construction are included.

Wildlife sweeps were conducted on foot at all locations to observe the presence of wildlife and habitat features along and next to each proposed construction area (with the exception of Wayne Valley). Fieldwork was limited to the proposed construction route footprint in compliance with requests from landowners and the municipality. All wildlife observations, evidence of use and important habitat features observed were recorded (i.e., notes, UTM data and photographs).

# 3 RESULTS

## 3.1 Desktop Assessment

All sites are located within Native prairie – specifically the Northern Fescue Natural Subregion (NFNS) of the Grassland Region, within a large river system riparian zone landscape type (GOA 2019; NRC 2006). However,

Hoodoo Trail is near the mixedgrass subregion (approximately 1km to the border). Agriculture is the primary land use. Approximately 50% of the area is cultivated annually, with wheat being the main crop, although barley and canola are also important. Domestic grazing occurs across the remainder of the area. Oil and gas activity are important, and surface coal mining occurs as well. The relatively long summer season provides recreational opportunities such as camping and nature appreciation (NRC 2006).

Wildlife diversity and habitat is considered relatively high in the NFNS, including many terrestrial and aquatic habitats with distinct wildlife populations. Rock outcrops and badlands provide important habitats required by a number of bird species for nesting, including Golden Eagle, Ferruginous Hawk, Prairie Falcon, Rock Wren, Mountain Bluebird, and Say’s Phoebe (NRC 2006). Several endangered and threatened species, or species of concern, are contained mostly within the boundaries of the Grassland Natural Region. Examples include the Burrowing Owl (listed as “Endangered” by COSEWIC, and “Threatened” by the Government of Alberta), Long-billed Curlew (a “Species of Special Concern” by both COSEWIC and the Government of Alberta), and Sprague’s Pipit (listed as “Threatened” by COSEWIC, and a “Species of Special Concern” by the Government of Alberta) (NRC 2006).

### Focal Wildlife Species and Industry Guidelines

Several species of management concern with known historical occurrences are found within 2 km of the proposed construction areas (Table 1). Provincially recommended construction setbacks of a minimum of 100 m apply to sensitive wildlife features belonging to species of management concern, including nests, dens, leks, breeding ponds, mineral licks, and hibernacula (GOA 2018a). Records listed are actual observations of individuals rather than sensitive wildlife features. As such they do not require mitigation unless their associated features are located near project space (Table 1).

**Table 1: Historical Wildlife Observations (Species of Management Concern) within 2 km of the proposed construction sites.**

Location	Species <sup>1</sup>	COSEWIC Classification <sup>2</sup>	Provincial Classification	
			Wildlife Act <sup>3</sup>	General Status <sup>4</sup>
Nacmine	Northern Leopard Frog	Special Concern*	Threatened	At Risk
	Canadian Toad	Not at Risk	Data Deficient (May be At Risk)	May Be at Risk
North Drumheller	Prairie Rattlesnake	Special Concern*	Special Concern	Sensitive
Rosedale	Bald Eagle	Not at Risk	No ranking	Sensitive
	Bull Snake	Special Concern	No ranking	Sensitive
	Burrowing Owl	Endangered*	Endangered	At Risk
	Northern Goshawk	Not at Risk		Sensitive
	Prairie Rattlesnake	Special Concern*	Special Concern	Sensitive
Wayne Valley	Prairie Rattlesnake	Special Concern*	Special Concern	Sensitive
Hoodoo Trail	Northern Leopard Frog	Special Concern*	Threatened	At Risk

\* Species listed under Schedule 1 of the *Species at Risk Act* (GOC 2019). Schedule 1 includes species that are to be protected on all federal lands in Canada.

<sup>1</sup> Historical observation obtained from Fisheries and Wildlife Management Information System (FWMIS) Records (AEP 2020a)

<sup>2</sup> Species listed by the Committee on the Status of Endangered Wildlife in Canada (GOC 2019)

<sup>3</sup> Species listed under the Alberta *Wildlife Act* (GOA 2017) by the Endangered Species Conservation Committee (ESCC), using definitions based on COSEWIC.

<sup>4</sup> Status designations assigned in the 2015 General Status of Alberta Wild Species Report (GOA 2017b)

The Landscape Analysis Tool (LAT) was used to generate descriptions of specific sampling approach for wildlife within the proposed construction area footprints. LAT report results show all proposed construction areas have the same wildlife survey requirements based on the sensitive layers they intersect. Applicable survey dates and restrictions are summarized in Table 2.

**Table 2: LAT report. Sensitive Wildlife features intercepted by the proposed construction footprint.**

Location	Species Layer <sup>1</sup>	Wildlife survey required	Survey Dates <sup>2</sup>	Permit required	Notes <sup>2</sup>	Survey Buffer <sup>2</sup>
All	Burrowing Owl Range	Call playback Survey Ground Survey	Call playback: May 15 -July 15 Ground Search: May 15 -Aug 31	For call playback survey	If survey is being conducted outside of recommended ground search timeframe two site visits are required	<b>High risk:</b> Year-round: 500 m <b>Med Risk:</b> Oct 1 - March 31: 100 m April 1 - Aug 15: 500 m <b>Low:</b> Oct 1 - March 31: 50 m April 1 - Aug 15: 500 m
	Sharp-tailed Grouse Survey	Sharp-tailed Grouse Survey	Mid-March - early/mid-May	Yes	Two surveys per site	<b>Med/High risk:</b> Year-round: 500 m <b>Low Risk:</b> March 15 - June 15: 500 m June 16 - March 14: 100 m
	Sensitive Raptor Range	Prairie Raptor Survey	May 1 - June 30	No	Linear disturbance. 1Km buffer search	<b>High risk:</b> Year-round: 1000 m <b>Med/Low Risk:</b> July 16 - March 14: 100 m
	Other Sensitive and Endangered Species	Snake Hibernacula Searches	April 1 - June 15 or Aug 15 - Oct 31	No	Two visits per site	<b>High risk:</b> Year-round: 500 m <b>Med/Low Risk:</b> Nov 1 - March 14: 50 m

<sup>1</sup>AEP 2020b

<sup>2</sup>GOA 2013

## 3.2 Habitat Description

The five locations to be stabilized are located along the north and south bank of the Red Deer River valley near the Town of Drumheller, Alberta. The Red Deer River Valley is an important corridor for wildlife, connecting the Parkland and Grassland Natural regions. River banks and riparian areas provide high-quality habitat for birds, mammals, reptiles and amphibians. However existing anthropogenic activity has reduced availability of habitat for sensitive wildlife.

The following is a description of wildlife observed at each of the sites. Environmental conditions consisted of: temperature -4 - 5 °C, mix of sun/cloud, wind light, no precipitation, 1-2 cm of snow (October 20-21, 2020). The biologists completed the inventory on foot along a specified route within the footprint of construction proposed (Figures 1 to 4).

### 3.2.1 Nacmine

Vegetation in the Nacmine location was dominated by mixed mature deciduous forest with a shrub understory, adjacent to a housing development (Figure 1). This is moderate quality habitat for migratory bird nesting. The western portion of the route follows a bank that could provide denning habitat, although the proximity to houses with domestic pets and regular disturbance may dissuade sensitive species (Plate 1). Two seasonal wetlands found along the route provide high-quality habitat for amphibians during breeding seasons (Plate 2). The eastern and south-eastern route portions follow the south bank of the Red Deer River where a mix of shrubs and mature trees are found along the route. Fresh beaver chew and recently downed woody debris were observed along the river bank. Human use and disturbance within this area is prolific, especially near the shoreline.

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### **3.2.2 Northern Drumheller**

The North Drumheller route (Figure 2) follows the north bank of the Red Deer River through a residential area of the Town of Drumheller (Plate 3). Proposed construction areas are eroded and residential developments border both sites of the river bank. Large mature deciduous trees lining the bank may provide habitat for owls and other cavity dwelling birds (Plate 4). One stick nest was observed on the south bank of the river (200m) from the proposed construction area. Proximity with residential areas and recent construction activity are indicators of low-quality habitat for wildlife.

### **3.2.3 Rosedale**

The Rosedale location (Figure 3) has an abundance of mature deciduous trees with many cavities. The cavities may provide habitat for owls, woodpeckers, and other cavity dwelling birds (Plate 5). The sweep route followed the river bank, which provides denning habitat for coyote and red fox, although the proximity to houses with domestic pets may dissuade more sensitive species. The south-east portion of the route includes open grasslands, and transitions into badlands with more possibility for snake hibernacula and Sharp-tailed Grouse than the western portion (Plate 6).

### **3.2.4 Hoodoo Trail**

The Hoodoo Trail (Figure 4) is surrounded by a mix of shrubs and grass species offering potential nesting habitat for migratory birds (Plate 7). However, removed vegetation, stripped topsoil and culvert installation were recorded along the route (Plate 8). Habitat disturbance and proximity to HWY 10 provide a low-quality habitat for wildlife activity.

### **3.2.5 Wayne Valley**

Based on the desktop assessment and visual overview from the road, wildlife and its use of habitat are expected to be similar to those found along the Rosedale footprint (Plates 9 and 10). Wayne Valley was not directly accessed due to landowner approval constraints at the time of on-site investigation.

## **3.3 Wildlife Sweep Observations**

### **3.3.1 Mammals**

Ten mammals were observed during the wildlife sweeps (tracks and pellets) including coyote, red fox, long-tailed weasel and American badger (Plate 11). Coyote tracks and a potential den were found within mixed wood habitats and along the river bank. Red fox tracks were observed within mixed wood habitat along the river. Long-tailed weasel tracks were observed by the river bottom and in the vicinity of water. No active mammal dens were observed along the swept areas (Table 3).

Small mammals and their signs (diggings and burrows) were observed during the wildlife sweeps including Richardson's ground squirrel, northern pocket gopher, and red squirrel. Evidence (burrows) of Richardson's ground squirrel, red squirrel dens, and northern pocket gopher were observed along the Nacmine and Rosedale proposed construction areas. Mountain cottontail were observed within a mixed deciduous forest 50 m from the river bank at the proposed Nacmine construction area.

Beaver activity (chewed trees) was observed along the proposed Nacmine construction area (Plate 12). An active beaver dam was reported by the AAR aquatic assessment crew on October 20, 2020 in the north portion the Michichi Creek.

Ungulate species and their signs (tracks and pellets) were observed during the wildlife sweeps. Tracks and pellets of moose and white-tailed deer were common along the river bank and in low shrubs areas (Plate 13). White-tailed deer features were observed at interspersions of cover types, the edges of hardwood forest, and bank streams. No

mineral licks were observed during the wildlife field work. A small herd of mule deer was observed in steep broken terrain close to the Red Deer River within the vicinity of the Rosedale area.

**Table 3: Incidental wildlife and wildlife feature recorded within five locations along the Red Deer River Valley October 20 to 21, 2020.**

Wildlife Features	COSEWIC Classification <sup>1</sup> *Schedule 1 SARA listed	Provincial Classification	
		Wildlife Act <sup>2</sup>	General Status <sup>3</sup>
<b>Nacmine</b>			
<b>Birds</b>			
Ring-necked Pheasant	No Status	No Status	Exotic
Black-capped Chickadee	No Status	No Status	Secure
Canada Goose	No Status	No Status	Secure
Common Raven	No Status	No Status	Secure
Dark-eyed junco	No Status	No Status	Secure
Black-billed Magpie	No Status	No Status	Secure
Ferruginous Hawk	Threatened*	Endangered	At Risk
Prairie Falcon (burrow on a cliff ledge)	Not at Risk	Special Concern	Sensitive
Stick Nest	N/A	N/A	N/A
<b>Ungulates</b>			
White-tailed Deer (tracks)	No Status	No Status	Secure
<b>Other</b>			
Beaver (sign)	No Status	No Status	Secure
Coyote	No Status	No Status	Secure
Red Squirrel	No Status	No Status	Secure
Northern Pocket Gopher	No Status	No Status	Secure
<b>Rosedale</b>			
<b>Birds</b>			
Ring-billed Gull	No Status	No Status	Secure
Common Raven	No Status	No Status	Secure
Canada Goose	No Status	No Status	Secure
Black-billed Magpie	No Status	No Status	Secure
Black-capped Chickadee	No Status	No Status	Secure
Blue Jay	No Status	No Status	Secure
American Tree Sparrow	No Status	No Status	Secure
Greater Yellowlegs	No Status	No Status	Secure
Northern Harrier	Not at Risk	No Status	Secure
Eared Grebe	No Status	No Status	Secure
Mallard	No Status	No Status	Secure
Rock Pigeon	No Status	No Status	Exotic/Alien
Stick Nest	N/A	N/A	N/A
<b>Ungulates</b>			
Moose (tracks)	No Status	No Status	Secure
White-tailed Deer (tracks)	No Status	No Status	Secure
Mule Deer	No Status	No Status	Secure
<b>Other</b>			
Coyote	No Status	No Status	Secure
Red Squirrel	No Status	No Status	Secure
Northern Pocket Gopher	No Status	No Status	Secure
Richardson's ground squirrel	No Status	No Status	Secure
<b>North Drumheller</b>			
<b>Birds</b>			
Long-tailed weasel (tracks)	Not at Risk	No Status	May Be at Risk
Great Blue Heron (tracks)	No Status	No Status	Sensitive
Black-capped Chickadee	No Status	No Status	Secure
<b>Ungulates</b>			
White-tailed Deer (tracks)	No Status	No Status	Secure



Wildlife Features	COSEWIC Classification <sup>1</sup> *Schedule 1 SARA listed	Provincial Classification	
		Wildlife Act <sup>2</sup>	General Status <sup>3</sup>
<b>Others</b>			
Beaver	No Status	No Status	Secure
Mollusc	No Status	No Status	Unknown
Coyote	No Status	No Status	Secure
Red Squirrel	No Status	No Status	Secure
Red Fox	No Status	No Status	Secure
<b>Hoodoo Trail</b>			
Snow goose	No Status	No Status	Secure
Clay-colored sparrow	No Status	No Status	Secure
Bald Eagle	Not at Risk	No Status	Sensitive
Common Raven	No Status	No Status	Secure
Canada Goose	No Status	No Status	Secure
Black-billed Magpie	No Status	No Status	Secure
Black-capped Chickadee	No Status	No Status	Secure
Sandhill Crane	No Status	No Status	Sensitive
<b>Ungulates</b>			
White-tailed Deer (tracks)	No Status	No Status	Secure
<b>Other</b>			
Coyote	No Status	No Status	Secure
Red Squirrel	No Status	No Status	Secure
Long-tailed Weasel	No Status	No Status	May Be at Risk

\* Species listed under Schedule 1 of the *Species at Risk Act* (GOC 2019). Schedule 1 includes species that are to be protected on all federal lands in Canada.

<sup>1</sup> Species listed by the Committee on the Status of Endangered Wildlife in Canada (GOC 2019)

<sup>2</sup> Species listed under the Alberta *Wildlife Act* (GOA 2017) by the Endangered Species Conservation Committee (ESCC), using definitions based on COSEWIC.

<sup>3</sup> Status designations assigned in the 2015 General Status of Alberta Wild Species Report (GOA 2017b)

### 3.3.2 Birds

A total of 5 passerine species were observed during the wildlife sweep, none of which are provincially or Federal listed species (Table 3).

#### **Raptors**

Raptors observed during the wildlife sweep included a ferruginous hawk (provincially-listed as At Risk) flying over the Red Deer River at the Nacmine location, approximately 400 m north of the proposed construction footprint. No evidence of an active or inactive nest was observed within 500 m of the incidental observation. A northern harrier and bald eagle were observed within the vicinity of the proposed Rosedale construction area. One inactive stick nest was observed along the south river bank of the Rosedale location (Plate 14). Owls were not observed during the wildlife sweeps; however, a few cavities in live trees and dead snags were observed, which can be used as nesting habitat by owl species.

#### **Woodpeckers**

No woodpeckers were observed along the proposed construction areas; however, the south-east portion of the proposed Rosedale construction area is dominated by a mix of mature Aspen, Poplar, Birch, and Cottonwood tree species which provide high quality habitat for woodpeckers (Plate 15, 16). Evidence of inactive woodpecker nests were observed during the wildlife sweep.

#### **Upland Game Birds**

A ring-necked pheasant was observed within the north-west portion of the Nacmine construction area.

## Amphibians and Reptiles

No evidence of amphibians or reptiles was observed during the wildlife sweeps. However, historical reports including Northern leopard frog and Canadian toad have been made within 2 km of the proposed Nacmine construction area (AEP 2020a). No high-quality habitat for these sensitive species were observed. Bull snakes and various garter snakes are known to occur within the general vicinity of the proposed construction areas. Prairie rattlesnakes have a very limited distribution in the Red Deer River valley near Drumheller. The association between available habitat in the proposed construction areas in the Drumheller and requirements of sensitive species identified through historic observations is summarized in Table 4 (AEP 2020).

**Table 4: Historical Wildlife Observations (Species of Management Concern) and habitat availability at proposed construction sites.**

Location	Species	Key Habitat Features	Availability of Key Habitat Feature
Nacmine	Northern Leopard Frog	Permanent, deep wetlands	none
	Canadian Toad	Sandy or gravel soils, temporary wetlands	potentially
North Drumheller	Prairie Rattlesnake	Fissures, sinkholes, outcrops	none
Rosedale	Bald Eagle	Large trees adjacent to fish-bearing lakes or rivers	limited
	Bull Snake	Fissures, sinkholes, outcrops	limited
	Burrowing Owl	Open native grasslands, ground squirrel activity	none
	Northern Goshawk	Mature boreal forests	none
	Prairie Rattlesnake	Fissures, sinkholes, outcrops	none
Wayne Valley	Prairie Rattlesnake	Fissures, sinkholes, outcrops	none
Hoodoo Trail	Northern Leopard Frog	Permanent, deep wetlands	none

## 4 DISCUSSION

### 4.1 Conclusion and Recommendations

As a result of existing anthropogenic activities present, additional adverse effects to wildlife and their habitat within areas surrounding construction projects proposed are not anticipated. Mitigation measures listed below are recommended to be implemented before and during constructions activities (Table 5).

#### 4.1.1 Migratory Breeding Birds

The Project is located in bird nesting Zone B4 with a RAP of April 15 to August 31 (GOC 2019). Migratory breeding birds and their habitats are protected by the federal *Migratory Birds Convention Act*. The peak breeding and nesting period in the Project area extend from May 1 to August 15, with a protective extension to August 31 in productive wetland habitats and at known nesting locations of federally listed bird species. There is a higher risk of incidental take (i.e. unintended disturbance or destruction of birds, eggs, or nests) if vegetation (habitat) clearing occurs during breeding and nesting periods.

If construction activities need to be completed during the spring/summer nesting season, migratory nest sweeps should be conducted in each area within 7 days prior to any construction activity. Any nest found during the nesting period should be protected with a buffer zone until the young have permanently left the vicinity of the nest (GOC 2019). A mitigation plan needs to be implemented ensuring construction activities would not harm migratory bird species.

#### 4.1.2 Wildlife Surveys

Pre-construction sensitive wildlife surveys (Raptors, Sharp-tailed Grouse, Burrowing Owl and Snake Hibernacula Searches) should be conducted at each location: Nacmine, North Drumheller, Rosedale, Hoodoos Trail, and Wayne

Valley. All related surveys (pre-and post-construction) and analysis of data are required to be submitted by an experienced wildlife biologist. Survey results are to be submitted to the AEP Fish and Wildlife Management System (FWMIS). If sensitive wildlife features are detected implementation of mitigation measures is required. A description of time frames for sensitive wildlife surveys is included in Table 5.

**Table 5: Sensitive wildlife surveys time frames**

Wildlife requirement	Time frame	Regulator
Migratory nest sweep	Schedule construction activities before or after the migratory bird RAP (Nesting Zone B4 with a RAP of April 15 to August 31 (GOC 2018). If construction may occur within the nesting period (soil stripping, shrubs and grass mow or pre-clear), a Migratory nest sweep must be conducted within the construction footprint and 50m buffer to identify active nest.	Migratory Birds Convention Act, 1994 (MBCA)
Raptor Survey	Construction activities are scheduled to be completed within a Sensitive Prairie Raptor Range (GOA 2013). Prairie raptor survey must be conducted during the breeding season, May 1 to June 30.	Alberta's Wildlife Act 2020
Sharp-tailed Grouse lek survey	Construction activities are scheduled to be completed within the Sensitive Sharp-tailed Grouse Range (GOA 2013). A Sharp-tailed Grouse lek survey must be conducted during mid-March to mid-May.	Alberta's Wildlife Act 2020
Burrowing Owl survey  Nocturnal Owl Nesting Survey	Construction activities are scheduled to be completed within the Sensitive Burrowing Owl Range (GOA 2013). Call playback surveys should be conducted between May 15 and July 15. Ground searches should be conducted between May 15 and August 31.  Call playback surveys should be conducted between Feb 15 and May 15.	Alberta's Wildlife Act 2020  Alberta's Wildlife Act 2020

The supplemental wildlife sweeps conducted on October 20 and 21, 2020 provided an opportunity to review wildlife habitat and wildlife features along the proposed construction areas of Nacmine, North Drumheller, Rosedale, and Hoodoo Trail. Based on the desktop review and wildlife field work, at present there are no adverse effects to possible construction activities to any wildlife or wildlife features that were observed. However, additional wildlife surveys that follow AEP's specific timing protocols will be required to ensure full regulatory compliance. All incidental records, occurrences of sensitive species, and wildlife features will be submitted to the Fish and Wildlife Management Information System (FWMIS).

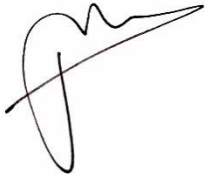
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## 5 CLOSURE

Please do not hesitate to contact us if you have any questions. We can be reached at (403) 294-0488, or by email at [jrodriguez@appliedaquatic.com](mailto:jrodriguez@appliedaquatic.com).

Sincerely,

**Applied Aquatic Research Ltd.**



**Julio Rodriguez, B.Sc**  
*Intermediate Wildlife Biologist*



**Sabina Hamilton, B.A.Sc**  
*Wildlife Biologist*

Reviewed by:



**Chris Fisher, MSc, P.Biol.**  
*Senior Wildlife Biologist*

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## Appendix A

## Photo Plates



**Plate 1.** Nacmine. West bank of the proposed construction footprint (October 20, 2020).



**Plate 2.** Nacmine. Seasonal wetland. High quality habitat for non-sensitive amphibians in the breeding season (October 20, 2020).

Date & Time: Tue Oct 20 15:17:11 MDT 2020  
Position: 12 N 380230 5703009  
Altitude: 681m  
Datum: WGS-84  
Azimuth/Bearing: 328° N34W 5796mils (True)  
Zoom: 1X  
AAR20-105  
North Drumheller



**Plate 3.** North Drumheller. North bank of the Red Deer river follows a residential area (October 20, 2020).

Date & Time: Tue Oct 20 15:31:26 MDT 2020  
Position: 12 N 380335 5702962  
Altitude: 682m  
Datum: WGS-84  
Azimuth/Bearing: 016° N16E 0284mils (True)  
Zoom: 1X  
AAR20-105  
North Drumheller



**Plate 4.** North Drumheller. Mature trees could provide habitat for owls or woodpeckers species (October 20, 2020).



**Plate 5.** Rosedale. Tree cavities could provide habitat for owls, woodpeckers, and other cavity dwelling birds and mammals (October 21, 2020).



**Plate 6.** Rosedale. Badlands could offer a possibility for snake hibernacula (October 21, 2020).





**Plate 7.** Hoodoos Trail. Mix of shrubs and grasses species offering a potential nesting habitat for migratory birds (October 21, 2020).



**Plate 8.** Hoodoos Trail. Recent vegetation clearing, stripping topsoil and culvert installation were recorded along the route (October 21, 2020).



**Plate 9.** Wayne Valley. West view of the proposed Wayne Valley construction area (October 21, 2020).



**Plate 10.** Wayne Valley. East view of the proposed Wayne Valley construction area (October 21, 2020).



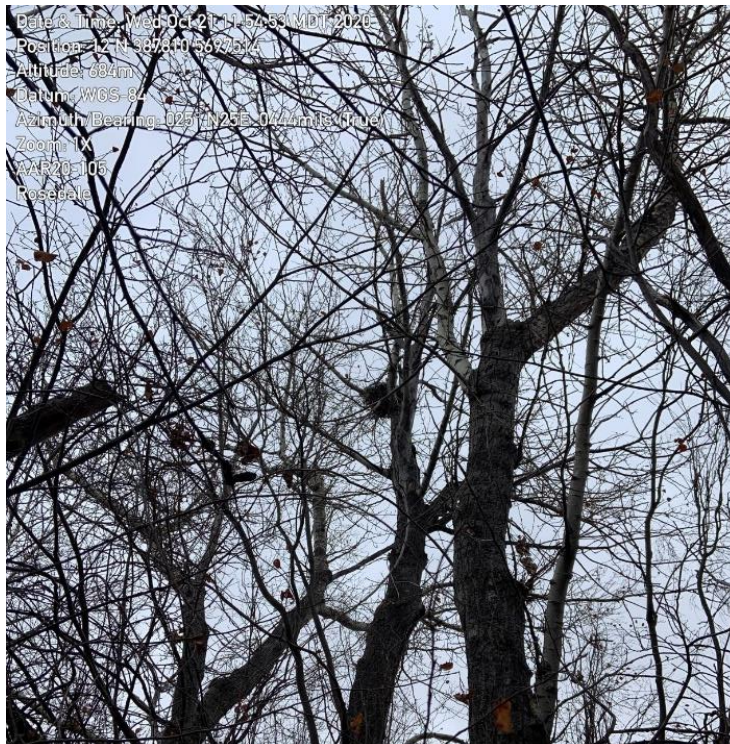
**Plate 11.** Nacmine. American badger tracks (October 20, 2020).



**Plate 12.** Nacmine. Fresh beaver chew and downed woody vegetation were observed along the river bank (October 20, 2020).



**Plate 13.** Rosedale. Fresh Moose pellet observed close to the river bank (October 21, 2020).



**Plate 14.** Rosedale. Inactive stick nest observed along the south river bank (October 21, 2020).



**Plate 15.** Rosedale. Inactive woodpecker cavity nest observed during the wildlife sweep (October 21, 2020).



**Plate 16.** Nacmine. High quality habitat such as wetlands and watercourses were found along the proposed construction footprint (October 20, 2020)

REFERENCE:  
1. AERIAL IMAGE FROM 2019 (PROVIDED BY DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE)

LEGEND:  
GPS TRACKS OF FIELD TEAM (OCT. 20, 2020) ———  
EXISTING DIKES ———



M:\Projects\20.2311.009\_1 Fish\CADD\Drawing Set\1\_1 ST-REPORT FIGS\FIG-202311009\_1-WILDLIFE.dwg, FIG.1, 2021/10/10 01:34 pm User

50 0 50  
SCALE:1:3,000 METRES

SCALE NOTATIONS INDICATED ARE BASED ON AN ISO A1 DRAWING FORMAT

THIS DRAWING IS PREPARED FOR THE SOLE USE OF THE DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE. NO REPRESENTATIONS OF ANY KIND ARE MADE BY SWEETECH ENGINEERING CONSULTANTS OR ITS EMPLOYEES TO ANY PARTY WITH WHOM SWEETECH ENGINEERING CONSULTANTS DOES NOT HAVE A CONTRACT.

**FIG.1 WILDLIFE SWEEP ROUTE - NACMINE**

REFERENCE:  
1. AERIAL IMAGE FROM 2019 (PROVIDED BY DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE)

LEGEND:  
GPS TRACKS OF FIELD TEAM (OCT. 20, 2020) - - - - -  
EXISTING DIKES - - - - -



**FIG.2 WILDLIFE SWEEP ROUTE - NORTH DRUMHELLER**

M:\Projects\20.2311.009\_1 Fish\CADD\Drawing Set\1\_1 ST+REPORT FIGS\FIG-202311009\_1-WILDLIFE.dwg, FIG.2, 2021/10/10 01:13 pm User

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SCALE:1:2,000 METRES  
SCALE NOTATIONS INDICATED ARE BASED ON AN ISO A1 DRAWING FORMAT

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REFERENCE:  
1. AERIAL IMAGE FROM 2019 (PROVIDED BY DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE)

LEGEND:  
GPS TRACKS OF FIELD TEAM (OCT. 20, 2020) - - - - -  
EXISTING DIKES - - - - -



**FIG.3 WILDLIFE SWEEP ROUTE - ROSEDALE**

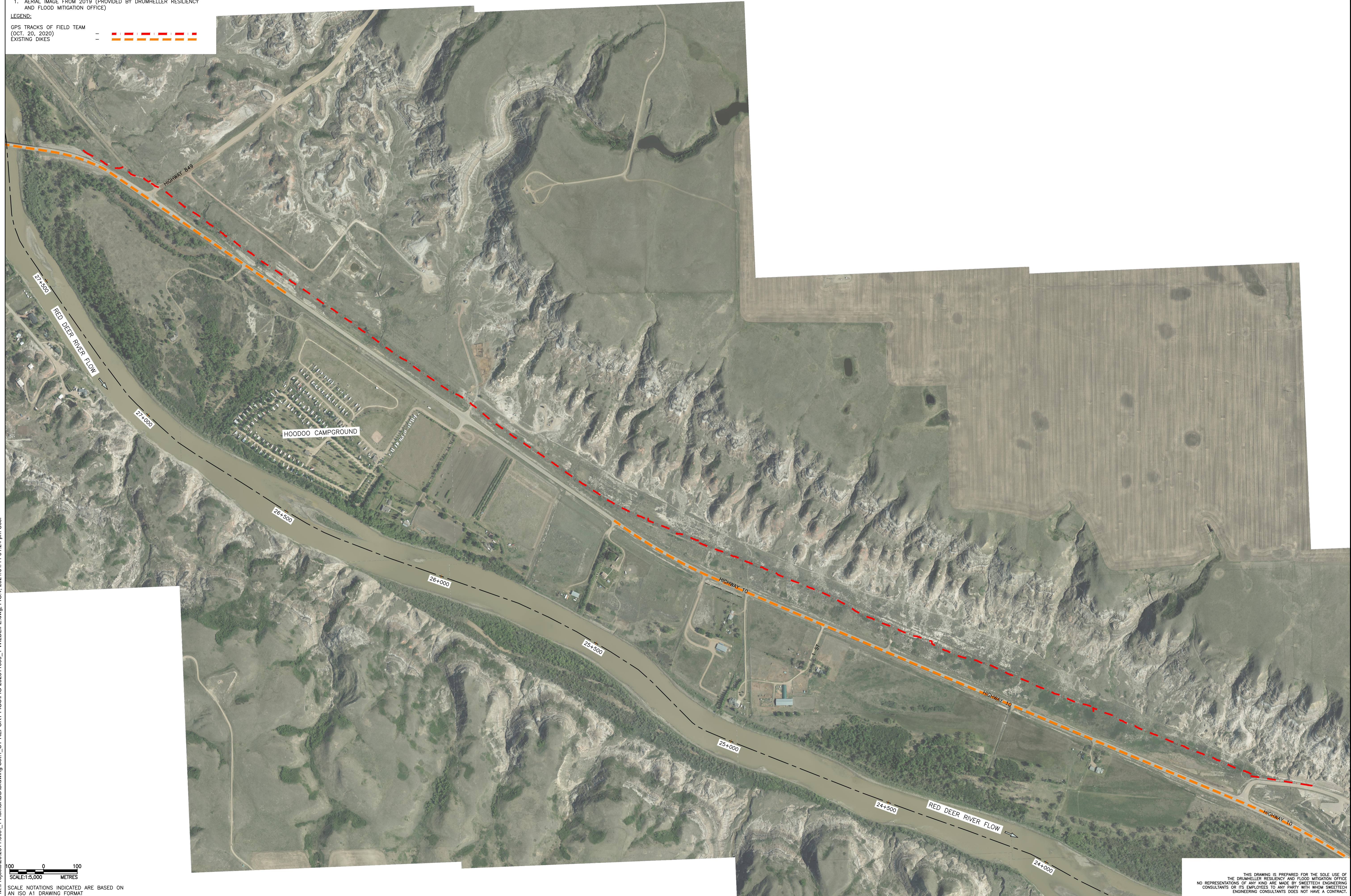
THIS DRAWING IS PREPARED FOR THE SOLE USE OF THE DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE. NO REPRESENTATIONS OF ANY KIND ARE MADE BY SWEETECH ENGINEERING CONSULTANTS OR ITS EMPLOYEES TO ANY PARTY WITH WHOM SWEETECH ENGINEERING CONSULTANTS DOES NOT HAVE A CONTRACT.

M:\Projects\20.2311.009\_1 Fish\CADD\Drawing Set\1\_1 Fish\REPORT FIGS\FIG-202311009\_1-WILDLIFE.dwg, FIG.3, 2021/01/01 01:13:00 pm User



REFERENCE:  
1. AERIAL IMAGE FROM 2019 (PROVIDED BY DRUMHELLER RESILIENCY AND FLOOD MITIGATION OFFICE)

LEGEND:  
GPS TRACKS OF FIELD TEAM (OCT. 20, 2020) - - - - -  
EXISTING DIKES - - - - -



M:\Projects\20.2311.009\_1 Fish\CADD\Drawing Set\1\_ST-REPORT FIGS\FIG-202311009\_1-WILDLIFE.dwg, FIG.4, 2021/01/11 01:24 pm User

100 0 100  
SCALE:1:5,000 METRES  
SCALE NOTATIONS INDICATED ARE BASED ON AN ISO A1 DRAWING FORMAT

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**FIG.4 WILDLIFE SWEEP ROUTE - HOODOO TRAIL**