

2009 Delta Bison Crop Damage Assessment Report

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Abstract: Delta bison crop damage assessment aerial surveys were conducted on August 20, September 1, and September 14, 2009 for grain crops in the Delta I and Delta II agricultural areas north of the Alaska Highway. Delta bison began moving out of the Delta Junction Bison Range and into agricultural lands north of the Alaska Highway on August 11. Damaged crops were identified and photographed. Digital photographs of bison damage were given to Division of Agriculture staff for assessment.

Introduction

During the 2009 Alaska Department of Fish and Game (ADF&G) Delta bison management planning process the Delta Bison Working Group and other participants determined that having an assessment of bison damage to agricultural crops would be an important set of data to acquire. Therefore, ADF&G and Alaska Department of Natural Resources, Division of Agriculture (ADNR) agreed to cooperate on a Delta bison crop damage assessment program during fall 2009.

ADF&G and ADNR agreed that the damage assessment would be based on an estimate of crop yield and acreage damaged calculated by ADNR staff. Four damage assessment aerial surveys were to be flown with one near the beginning of harvest, one near the end of harvest, and two in the interim.

Two assessment techniques were to be tested if possible. One technique was to take aerial photographs of damaged grain crops to allow a visual examination of the photographs for an estimation of acreage damaged. I was going to test the photographic technique. The second technique was to use a computer tablet with maps or photographs of the area to record damaged acreage, as currently conducted by Alaska Division of Forestry for timber surveys. Division of Agriculture staff was going to test the computer tablet technique.

Methods

I conducted the photographic surveys from a Piper PA-18 Supercub aircraft and observed all agricultural areas with grain crops north of the Alaska Highway in the Delta I and Delta II agricultural areas. I took photographs of grain crops that I identified as having bison damage. I identified bison damage by the evidence of trails through grain that appeared to be made by numerous animals and that showed other evidence of bison such as wallows, beds, or the presence of bison. I took the photographs from an altitude of 1,000 feet above ground level (AGL) to give adequate coverage and perspective of the damage. I took photographs at a focal length of approximately 50mm through an open window in the aircraft. I used large jpg files on a Canon 1D Mark3 digital single lens reflex camera with resolution of 3888 x 2592 pixels and 3.5 MB file size. I took the photographs to overlap if necessary to show the entire damaged area. In a few cases, I took photographs from an altitude higher than 1,000 feet AGL to give

an overview of the area. I recorded latitude and longitude of each damaged area in WGS 84 degrees decimal minutes. I also made a visual estimate of the total proportion of crops damaged in a farm tract.

Results

Bison were first observed by ADF&G north of the Alaska Highway on August 11 when 40 bison were seen on Tract 3 (Fig. 1), nine days prior to the first damage assessment survey. During the August 20 survey, 192 bison were seen on Tract 3 and 230 were observed on the Delta Junction Bison Range (DJBR) Gerstle Fields (Fig. 1). During the September 1 and 14 surveys all of the bison I observed were north of the Alaska Highway.

August 20 Survey

I flew the damage assessment flight with Golden Eagle Outfitters of Delta Junction from approximately 1745 hours until 1900 hours on August 20, 2009 for a cost of approximately \$250.

I identified 20 agricultural tracts that had grain crops (Table 1) and determined that 16 had no visible bison damage. Three tracts (F, 3, U) had damage that I estimated to total <1% of grain on each tract respectively (Fig. 2). One tract (5) had more damage that I estimated to be approximately 20% of grain on the tract. I observed numerous tracts with moose trails and beds and grain that was down due to environmental factors such as wind or rain.

I submitted sample photographs to ADNR Natural Resources Manager Charles Knight for initial evaluation as a damage assessment tool.

September 1 Survey

Prior to the September 1 survey, ADNR staff determined that using the computer tablet was not an acceptable method to document bison damage and we decided that I would continue to fly photographic surveys.

I flew the September 1 survey damage assessment flight from 1730 hours until 2050 hours for a cost of about \$425. This flight time included conducting an aerial bison census, which required about one-half of the flight time.

I surveyed the 20 agricultural tracts identified as having grain crops during the August 20 survey (Table 2). Harvest was underway ranging from 100% of grain crops harvested on some tracts and none harvested on others. Bison trails and damage to crops were more extensive than during the August 20 survey. Tract U owned by the Schultz's appeared to have the heaviest bison damage I observed. I saw no signs of bison damage on nine tracts. I took aerial photographs of those tracts that had bison damage for assessment by ADNR staff.

I observed the most bison on Peterson's Tract 1B where I counted a group of 227 bison in apparent CRP acreage. There were also approximately 100 bison in the Delta

Clearwater River bog. No bison were present on the DJBR.

September 14 Survey

I flew the September 14 survey from 0755 hours until 0910 hours for a cost of about \$240. I also conducted a bison census during this time.

I surveyed 19 of the same 20 agricultural tracts identified as having grain crops during the August 20 survey (Table 3). I did not survey Hendry's Tract 8E because it was difficult to determine if grain was present. However, I did survey Tract A3 on the south side of the Alaska Highway that had grain but I had not surveyed before.

Most grain crops were harvested at the time of this survey and much of the grain straw had also been baled (Table 3). Ron Nelson had just started harvesting potatoes on Tract V and there were extensive bison trails through the bare dirt on his tract and undoubtedly bison had been walking through his potatoes.

Bison were observed on several farm tracts. Peterson's Tract 4 had 14 bison in grain, Schultz's Tract U had 117 bison in CRP brome, Nelson's Tract V had 41 bison in brush, and Geier's Tract 8C (Figure 4) had 170 bison with most in brush but some in grain.

After the September 14 survey I determined that there was not enough unharvested grain remaining to justify flying another damage assessment survey. I gave digital copies of all photographs I had taken to Division of Agriculture staff. At the request of Mr. Ron Nelson I also gave him copies of photographs taken of his acreage.

Discussion

Based on the August 20 Delta bison assessment survey I felt that overall damage to agricultural crops was light at that time, although Tract 5 owned by Mike and Scott Schultz had received most of the damage that had occurred. It appeared to me that Tract 5 was receiving the majority of current damage because bison were attracted to this area because there was an abundance of CRP brome grass nearby which provided a large quantity of quality bison forage, the nearby Gerstle River and a gravel pit pond on Tract 5 provided bison with a water source, and the adjacent Gerstle River greenbelt provided easy escape cover for the bison.

At the time of the September 1 survey, bison had been present north of the Alaska Highway for an additional 12 days and there were more extensive bison tracks and damage within the agricultural tracts. Although harvest was underway, rainy and cool weather had delayed harvest during the previous 12 days. The Schultz acreage appeared to be receiving the most damage, with Tract U being most impacted at the time.

During the September 14 survey, most grain had been harvested which made determining additional damage difficult on those tracts where the grain was harvested. Harvest of straw was underway. All bison located were north of the Alaska Highway.

I think the photographic assessment technique was a practical and affordable method to determine the extent of bison crop damage. If damage becomes more extensive requiring substantially more photographs to be taken and organized then the technique would likely be more difficult and costly.

The quality of light appeared to influence the ability to observe and photograph bison crop damage from the air. Damage was easier to observe and photograph when the sky was clear and sunlight was bright and casting shadows versus when the sky was overcast and there were few shadows.

Based on my frequent observations of grain that was damaged due to environmental factors, damage assessment observers should be careful not to attribute damaged grain to wildlife if it had some other cause.

Table 1. August 20, 2009 Delta bison crop damage assessment data sheet.

Date: August 20, 2009

Time Off Delta: 5:45 pm

Time On Delta: Completed damage assessment at 7:00 pm; on Delta at 8:30 pm

Weather: Prtly cldy; 65F; wind 030 at 4 mph

Pilot: Jim Cummings

Observer: Steve DuBois

Aircraft: PA-18

Camera: Canon 1DMark3 at large jpg

| Farm Tract:Owner | Latitude/ Way Pt | Longitude | Photo file numbers | Description of Observed Damage |
|-------------------------|-----------------------------|------------------------|-------------------------------|---|
| B:Rule | | | | No visible bison damage (NVBD) |
| Robinson:Hanson Rd | | | | NVBD-moose trails |
| C-1:Wrigley | | | | NVBD-cow/calf moose; blow down |
| C-3:Robinson | | | | NVBD-blow down |
| G:Olson | | | 2459-2460 | NVBD-moose trails |
| E-1:Purviance | | | | NVBD-blow down |
| E-8:Green | | | 2461-2465 | NVBD-blow down |
| F:Green | 63°55.50 | 145°14.68 | trail 1 = 2466-2482 | 2 bison trails with no major wallows or |
| | 63°55.73 | 145°15.75 | trail 2 = 2483-2486 | feeding; trails & beds on eastern tree line |
| | | | NW damage = 2487- | & NW corner likely moose; total Tr F bison |
| | | | 2490 | damage ~<1% |
| | | | E. tree line = 2491- | |
| | | | 2492 | |
| H:Eagles Ridge | | | | NVBD-moose trails; blow down |
| 4A:Peterson | | | | NVBD |
| 4B:Peterson | | | | NVBD |
| 2:Heide | | | | NVBD |
| 3:Schultz | 64°01.11 64°01.36 | 145°06.40 145°05.82 | 2493-2494 | Damage in 2 areas; total ~<1% |
| 5:Schultz | 64°00.94 64°00.82 | 145°03.98 145°04.35 | 2496-2507 | Significant damage ~20% of Tr F |
| U:Schultz | 63°59.81 63°59.01 | 145°03.39 145°03.48 | 2510-2516 | Minor bison damage ~<1% in NW; blow down |
| 9D:Robinson | | | | NVBD-blow down |
| 8C:Geier | | | | NVBD |
| V:Nelson | | | | NVBD |
| Q:Green | | | | NVBD |
| S:Filla | | | | NVBD |

Table 2. September 1, 2009 Delta bison crop damage assessment data sheet.

Date: September 1, 2009

Time Off Delta: 5:30 pm

Time On Delta: 8:50 pm (completed simultaneous bison census)

Weather: Overcast, 60F, 090° @9mph

Pilot: Jim Cummings

Observer: Steve DuBois

Aircraft: PA-18

Camera: Canon 1DMark3 at large jpg

NVBD=No visible bison damage

| Tract:Owner | Latitude/ Way Pt | Longitude | Photo file numbers | Description of Observed Damage |
|--------------------|-------------------------|------------------|---------------------------|---|
| B: Rule | | | | NVBD; ~5% harvested |
| Hanson | | | | |
| Rd:Robinson | | | | NVBD; 0% harvested |
| C-1:Wrigley | | | | NVBD; moose trails; harvest starting |
| C-3:Robinson | | | | NVBD; 100% harvested |
| G:Olson | | | | NVBD; ~50-70% harvested |
| E-1:Purviance | | | | NVBD; 0% harvested |
| H:Eagle Ridge | 63°57.52 | 145°15.02 | 3027-3029 | Hvy bison trail on North fld; <1% damage; |
| H continued | | | | 0% harvested |
| E-8:Greens | | | | NVBD; 0% harvested |
| F:Greens | 63°56.50 | 145°16.78 | 3030-3036 | Hvy bison trails & wallows in NW oats |
| F continued | 63°55.22 | 145°15.84 | 3037-3039 | Trails of 4 griz bears obsrved by Cummings |
| F continued | | | | <1% damage TrF; 0% harvested |
| 4:Peterson | 63°00.03 | 145°09.19 | 3040-3045 | Hvy bison trails; <1% damage Tr4; 0% harv |
| 2:Hiede | 64°01.53 | 145°10.06 | 3046-3049 | Hvy bison trails; 5% damage; 0% harv |
| 2 continued | 64°01.76 | 145°11.16 | 3050-3053 | |
| 3:Schultz | 64°01.57 | 145°08.97 | 3054-3061 | Hvy bison trails; 5% damage; |
| 3 continued | 64°01.195 | 145°07.62 | 3062 | 48 bison in CRP; 33% harvested |
| 3 continued | 64°01.09 | 145°06.67 | 3063-3066 | |
| 5:Schultz | | | | Hvy bison trails in straw; 75% harvested |
| U:Schultz | 63°58.64 | 145°02.81 | 3067-3075 | Hvy bison trails; 5% damage; 50% harv |
| U continued | 63°59.07 | 145°02.92 | 3076-3086 | |
| V:Nelson | | | 3087-3094 | Hvy trails in dirt, hard to see in potatoes |
| 10A:Robinson | | | | 100% harvested |
| 8E:Hendry | 64°00.22 | 144°54.98 | 3094-3100 | Trails from bison or cows; 0% harvested |
| 8C:Geier | 64°00.73 | 144°58.78 | 3101-3103 | Bison trails; <1% damage; 0% harvested |
| Q:Green | | | | NVBD; 0% harvested |
| S:Filla | | | | NVBD; 0% harvested |
| | | | | |
| | | | | |

Table 3. September 14, 2009 Delta bison crop damage assessment data sheet

| Delta Bison Damage Data Sheet | | | | |
|-------------------------------------|------------------|-----------|--------------------|----------------------------------|
| Date: September 14, 2009 | | | | |
| Time Off Delta: 0755 | | | | |
| Time On Delta: 0910 | | | | |
| Weather: Prtly cldy; wind calm; 37F | | | | |
| Pilot: Cummings | | | | |
| Observer: DuBois | | | | |
| Aircraft: PA 18 | | | | |
| Camera: Canon 1DM3 | | | | |
| NVBD = No visible bison damage | | | | |
| Tract:Owner | Latitude/ Way Pt | Longitude | Photo file numbers | Description of Observed Damage |
| B:Rule | | | | 100% harvested; straw remaining |
| Hanson:Robinson | | | | 100% harvested; straw 50% |
| C1:Wrigley | | | | 100% harvested; straw 50% |
| C3:Robinson | | | | 100% harvested; straw 100% |
| G:Olson | | | | 100% harvested; straw 100% |
| E1:Purvivance | | | | 100% harvested; straw 50% |
| E8:Green | | | | 100% harvested; straw 100% |
| F:Green | | | | 50% harvested; 25% straw; |
| F continued | | | | no new visible bison damage |
| H:Eagle Ridge | | | | 100% harvested; 0% straw |
| 4:Peterson | | | | 75% harvested; 25% straw; |
| 4 continued | | | | no new visible bison damage |
| 2:Peterson | 64°01.83 | 145°10.38 | 4707-4710 | 50% harvested; 20% damage |
| 3:Schultz | | | | 100% harvested; straw 100% |
| 5:Schultz | | | | 100% harvested; straw 40% |
| U:Schultz | | | | 100% harvested; straw 100% |
| V:Nelson | 63°58.04 | 145°01.20 | 4715-4728 | 10% harvested; lots bison tracks |
| V continued | | | | in dirt |
| 8C:Geier | | | 4730-4737 | 20% harvested; 20% bison damage |
| 10A:Robinson | | | | 100% harvested; straw 100% |
| Q:Green | | | | 100% harvested; straw 0% |
| S:Filla | | | | 50% harvested; straw 0%; NVBD |
| | | | | |
| A3 | | | | 100% harvested |

Figure 1. Map of agricultural tracts north of the Alaska Highway that were surveyed during 2009 Delta bison crop damage assessment survey, and the Panoramic and Gerstle Fields of the Delta Junction Bison Range south of the Alaska Highway.

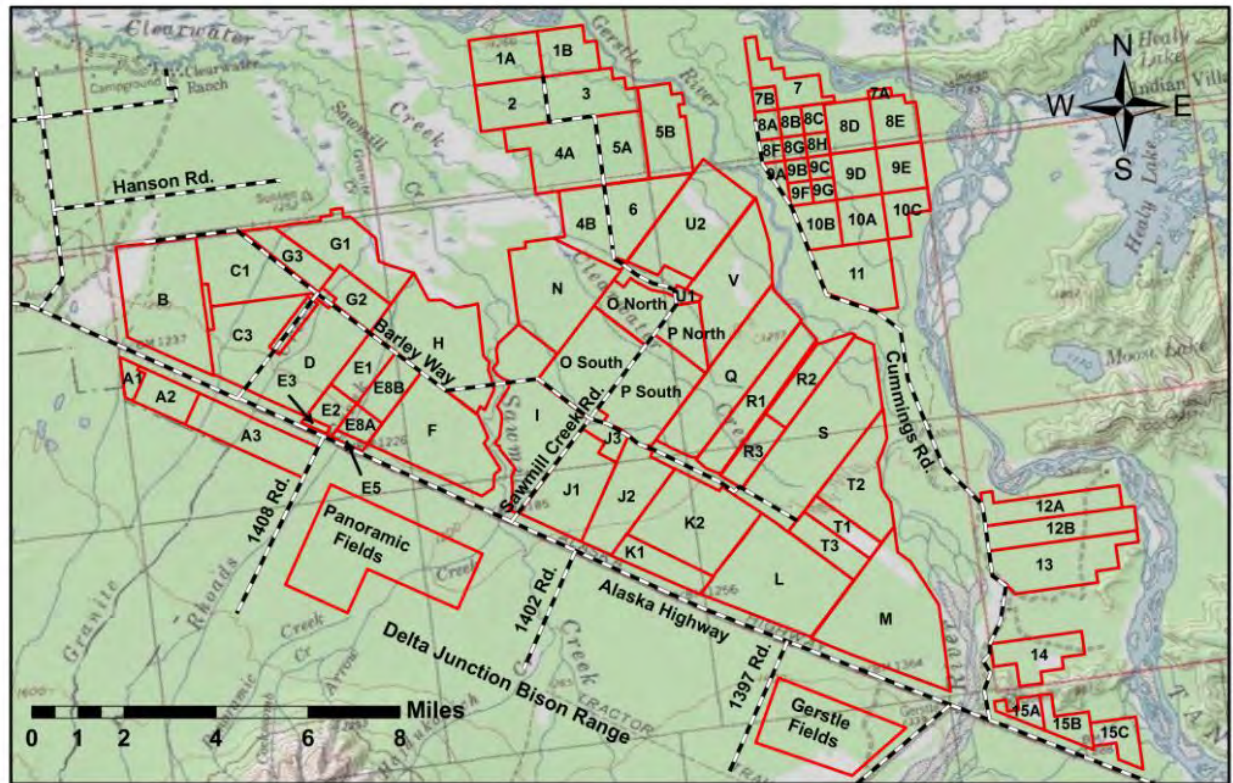


Figure 2. Overview photograph of a bison trail across agricultural Tract F taken on August 20, 2009 during a Delta bison crop damage assessment survey.



Figure 3. A portion of the bison damage observed on Tract U during the September 1, 2009 damage assessment survey.



Figure 4. Bison observed on Tract 8C during the September 14, 2009 damage assessment survey.

