

BREEDING WATERBIRD USE OF AGAY MENE AND KUSAWA TERRITORIAL PARKS, 2007

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INTRODUCTION

New areas set aside for conservation purposes within Yukon are commonly negotiated through the land claims process. Chapter 10 of the Umbrella Final Agreement (Minister of Indian Affairs and Northern Development 1993) allows for the creation of Special Management Areas (SMA) through a First Nations Final Agreement. An SMA can be designated as a national wildlife area, national or territorial park, migratory bird/wildlife sanctuary or any other agreed upon designation between a First Nation and government.

The Carcross/Tagish First Nation under Chapter 10 of their Final Agreement (Minister of Indian Affairs and Northern Development 2005a) identified Agay Mene for designation as a territorial park due to its biodiversity values. The proposed park would protect fish and wildlife from activities that would reduce fish and wildlife populations, recognize and protect traditional uses of the park by both First Nations, provide quality sport fishing and recreational activities for all Yukon people (Government of Yukon 2007a). Currently this park has not been formally established but is classified as a Natural Environment Park. This park falls within the traditional territories of both the Carcross/Tagish First Nation and Teslin Tlingit Council. The steering committee consisting of representatives of Yukon Government, Carcross/Tagish First Nation and Teslin Tlingit Council will be initiated in 2008 with a goal of completing a management plan for the park by 2010 (Government of Yukon 2007a).

The Carcross/Tagish and Kwanlin Dun First Nations both proposed a territorial park for Kusawa under Chapter 10 of their respective Final Agreements (Minister of Indian Affairs and Northern Development 2005a,b). In addition to the Carcross/Tagish and Kwanlin Dun Traditional Territories, Kusawa also overlaps with the traditional territory of the Champagne and Aishihik First Nation. The goals of this park are to protect an area of cultural significance to First Nations, recognize the traditional and current uses of the park by First Nations people, encourage use and awareness of the natural, cultural and historical values of the park, recognize current recreational uses of the park and offer economic opportunities to First Nations (Government of Yukon 2007b). Kusawa Territorial Park has not been formally established but it has been permanently withdrawn from mineral and oil and gas exploration through land claim

agreements. A steering committee has been created consisting of Yukon Government and the three affected First Nations to develop a management plan for the park (Government of Yukon 2007b).

Past work by Ducks Unlimited Canada (DUC) includes production of an earthcover map and three years of waterbird surveys that includes Kusawa and portions of Agay Mene through the Southern Lakes Project. The Southern Lakes Project documented waterbird use of ponds from 2000-2002 during the breeding, brood-rearing and fall staging periods. Ponds available for surveying were in portions of Agay Mene and all of Kusawa. Summaries of these surveys are found in van de Wetering et al. (2001, 2002).

In anticipation of the upcoming management plans, DUC undertook surveys to document the use of each of the parks by breeding waterbirds. We estimated the number of species and breeding pair density for each park and examine how birds are distributed throughout the park in order to provide park-specific waterbird information to the steering committees.

PROJECT AREA

Both Agay Mene and Kusawa are located in the southern portion of Yukon within the Southern Lakes region (Figure 1). Both areas are considered to have sporadic discontinuous permafrost (Natural Resources Canada 2003). Wildlife communities are similar between the two areas with moose, grizzly bear, caribou, Dall's sheep and mountain goat being common large mammals.

Agay Mene

Agay Mene is located approximately 80 km east of Whitehorse. Agay Mene is approximately 725 km² in size and is bounded in the west by Highway 7 (Atlin Highway), in the north by the Alaska Highway, in the south by the British Columbia-Yukon border. In the east the boundary encompasses upper Snafu Lake and all drainages flowing directly into the Snafu Lakes system as well as the western shore of the southern portion of Dalayee Lake (Figure 2). The topography of the region is varied with a minimum elevation of 700 m and a maximum of 1600 m within the park boundaries.

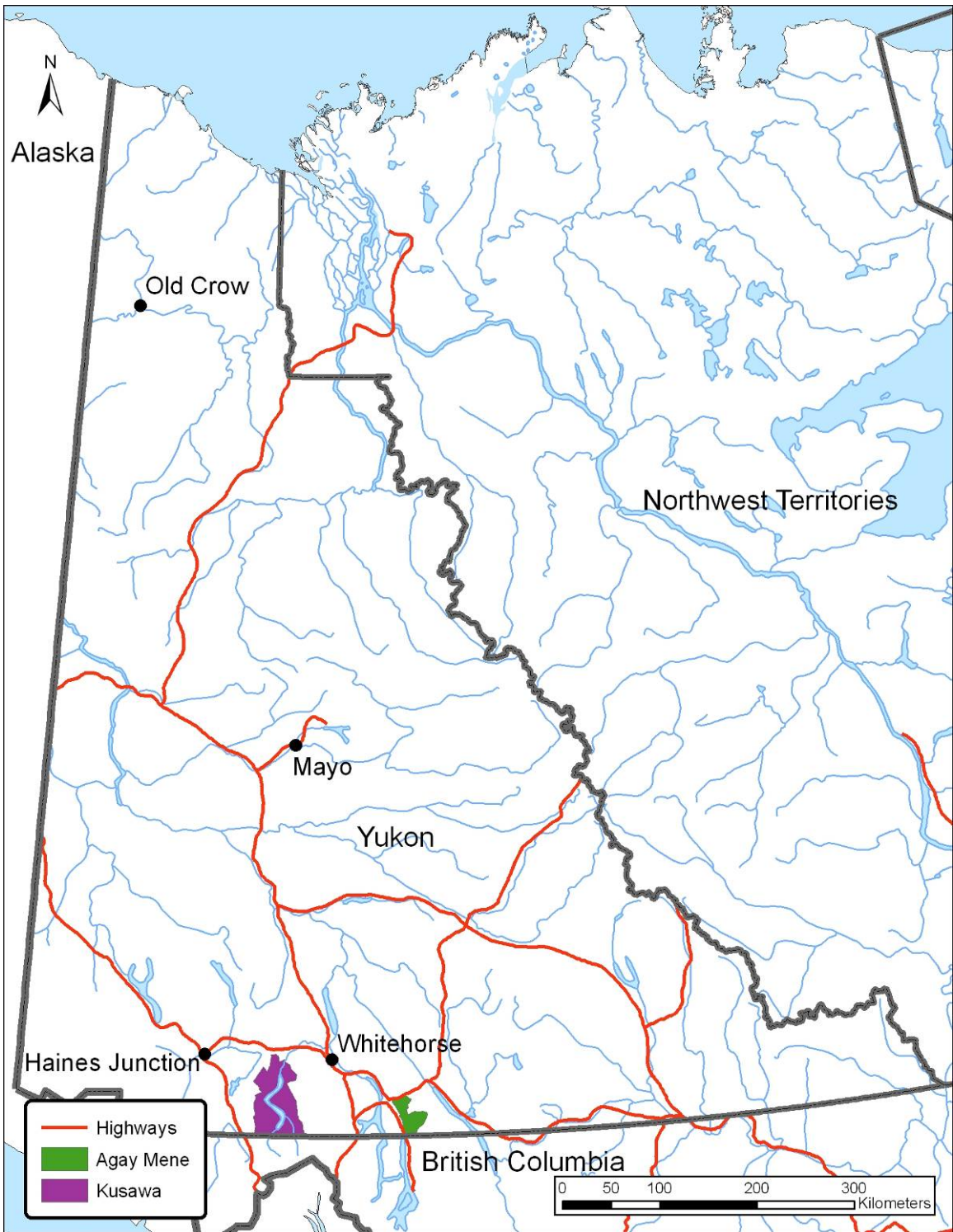


Figure 1: Location of the proposed Agay Mene and Kusawa Territorial Parks.

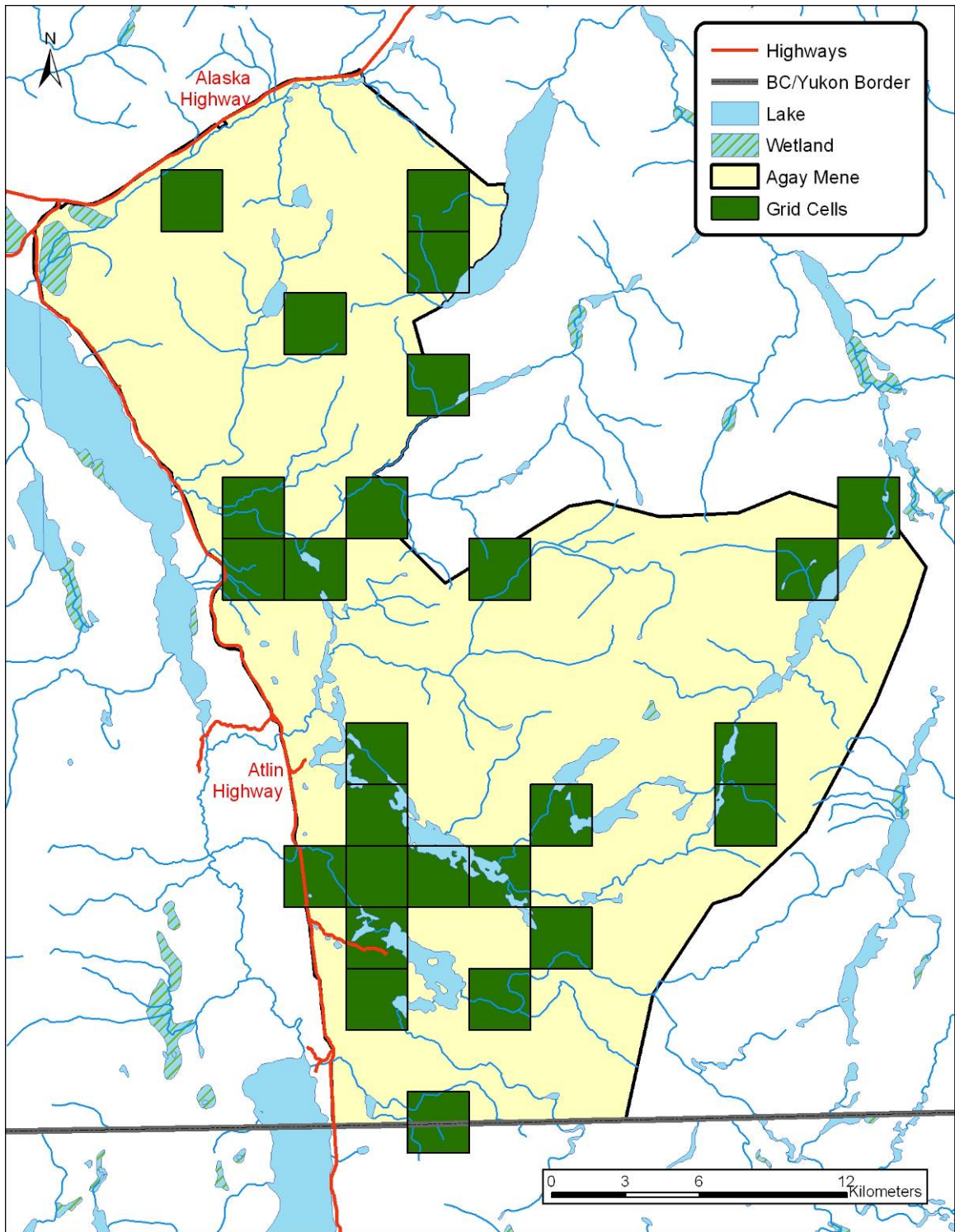


Figure 2: Agay Mene territorial park boundaries showing grid cells surveyed during breeding waterbird surveys by Ducks Unlimited Canada in 2007.

Agay Mene spans two ecoregions: Yukon Southern Lakes and Boreal Mountains and Plateaus (Ecological Stratification Working Group 1996). The majority of the park is within the Yukon Southern Lakes ecoregion while the southwest portion falls under the Boreal Mountains and Plateaus ecoregion. The Yukon Southern Lakes ecoregion is characterized by open forests of lodgepole pine at lower elevations. The Boreal Mountains and Plateaus ecoregion consists of rugged mountains with high plateaus and lowlands with a variety of vegetation habitats that are elevation dependant.

Kusawa

Kusawa is located approximately 60 km west of Whitehorse. The park is bounded in the south by the British Columbia-Yukon border, in the east by Primrose Lake and straight lines between nearby mountain peaks, in the west by the Kluhini River valley, Frederick Lake, and straight lines between mountain peaks to include drainages of Jo-Jo Lake, and in the north by portions of the Mendenhall River (Figure 3). In total, Kusawa covers approximately 3082 km². Kusawa has a large elevation gradient within the park as elevation changes from 700 m to 2400 m.

Three ecoregions are represented within the boundaries of the park although the Ruby Ranges ecoregion only makes up a small part of the western portion of the park. The rest of the park is roughly split between the Yukon Southern Lakes ecoregion in the northern portion of the park while the southern portion of the park is within the Yukon-Stikine Highlands ecoregion. The Yukon Southern Lakes ecoregion is characterized by open forests of lodgepole pine at lower elevations. The Yukon-Stikine Highlands receives little precipitation and low-level forests are composed of black and white spruce. Characteristic forests of the Ruby Ranges ecoregion are typically of northern boreal forests with black and white spruce with lodgepole pine.

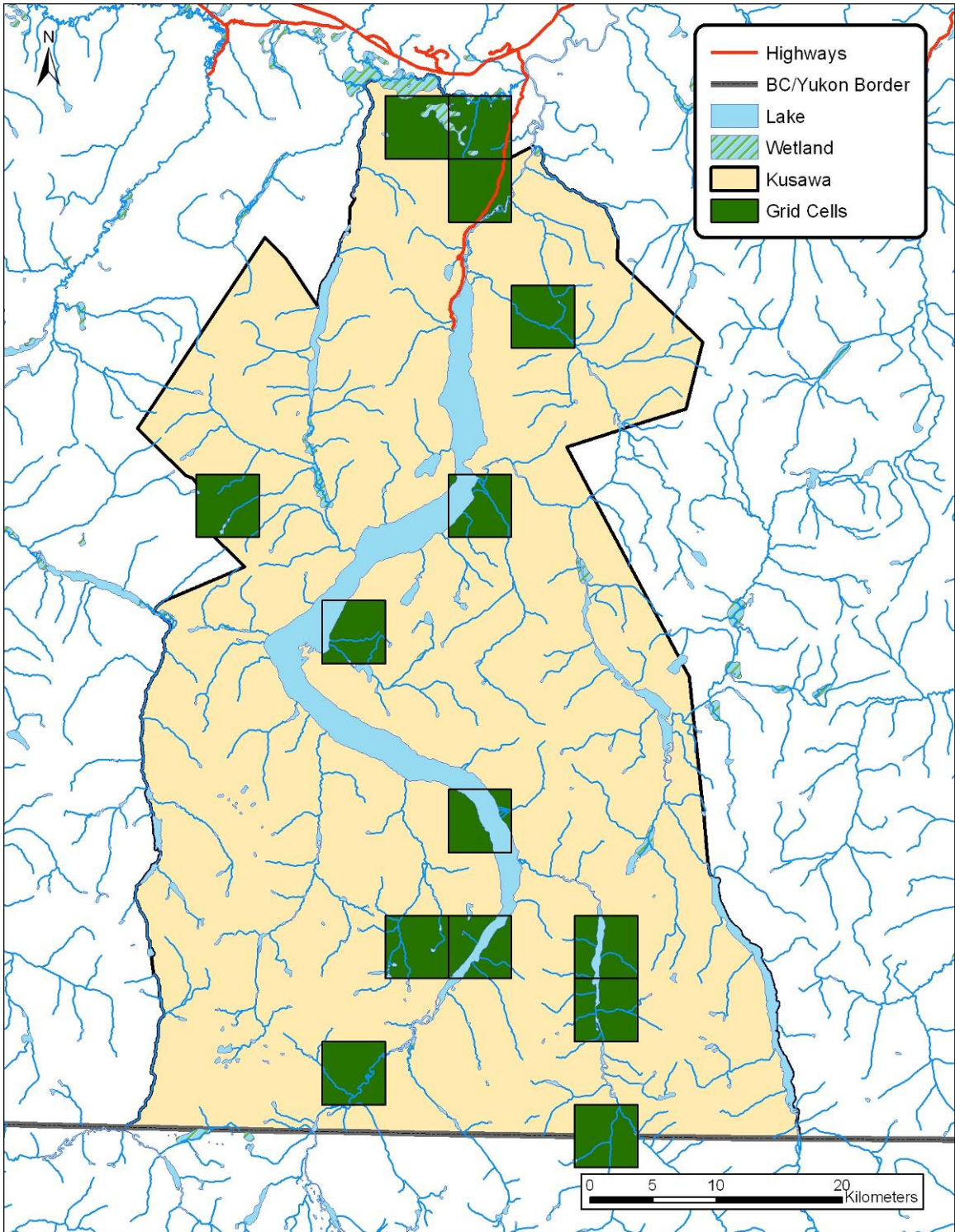


Figure 3: Kusawa territorial park boundaries showing grid cells surveyed during breeding waterbird surveys by Ducks Unlimited Canada in 2007.

METHODS

Site Selection

A grid map was placed over each park using the X-Tools Pro extension in ArcMap 9.2. Grid size for Agay Mene was 2.5 km by 2.5 km while the grid size used for Kusawa was 5 km by 5 km. The difference in size was to account for the differences in wetland density and overall size of the two parks. A grid based survey was chosen to allow calculation of waterbird densities in the absence of wetland specific information such as size, type or vegetation community. Grid based surveys allowed both basins and rivers to be surveyed. We surveyed approximately 22% and 11% of the land base of Agay Mene and Kusawa respectively.

Grid cells that contained no basins, based upon satellite imagery, or were predominantly outside of the park boundaries were excluded from the selection process. Grid cells were chosen randomly. Due to the size difference in grid cells, we chose a total of 26 grid cells at Agay Mene and 14 grid cells at Kusawa.

Survey Methods

Two breeding surveys were conducted at each site to assess the breeding population of waterbirds within each park. Agay Mene was surveyed on May 15 and 31 while Kusawa was surveyed on May 16 and June 1. A Bell 206 Jet Ranger fitted with bubble windows was used during each survey. The flight crew consisted of a three person crew; the pilot and 2 observers. The front left person beside the pilot observed and operated the navigating system ArcMap 9.1 software integrated with a Tracking Analyst moving map extension with a Global Positioning System (GPS) unit. The tracking system helped direct the flight path for the pilot and front observer to each grid cell and wetlands within. The second observer in the back right seat recorded observations on the opposite side of the aircraft from the navigator.

All selected grid cells were flown to achieve complete coverage. Each observer recorded the grid cell number, time of each observation and all waterbird observations within each grid cell using hand held cassette recorders (species identification, count, and social status). The time of each observation was used to link each observation with a GPS point to determine the location of the observation. All observations including waterbirds,

birds of prey and large mammals were recorded. We interpret waterbirds to consist of ducks, geese, swans, loons and grebes.

Our survey and safety protocol was modified from a Canadian Wildlife Service application outlined in the Black Duck Joint Venture (1996). The rotary winged aircraft flew surveys at an altitude of 10-30m above ground level. Ground speeds did not exceed 40 km/h, but were decreased as low as 20 km/h. The variation in flight level above ground and ground speeds occurred without compromising the crew's safety.

Data Analysis

Data analysis followed protocols based on Indicated Breeding Pairs (IBP), which were summarized by predefined social groupings. IBP for waterfowl is calculated by summing pairs, single isolated males, males in small all-male groups (2-4), and males in groups of two (2) males with one (1) female. All other large groupings or groupings of mixed sex suggest non-breeding population activity or spring staging at this time. However, this IBP formula excludes scaup spp., ring-necked duck, redhead and ruddy ducks which are known to be late nesters and have a disproportional number of males (U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987). IBP for these species was instead calculated by only summing the pairs observed. Estimates of IBP for early nest initiation species (mallard, northern pintail, bufflehead, goldeneye spp., common merganser, geese and swans) were derived by summing the IBP value from the first survey while the second survey was used for scaup, ring-necked duck, blue-winged teal, scoters, loons and grebes. The average IBP from both surveys was calculated for northern shoveler, American wigeon, green-winged teal, and unidentified mergansers. For swans, geese, loons and grebes (non-sexually dimorphic species), we assumed a breeding pair to be two birds within close proximity to one another or one adult sitting on a nest.

RESULTS

Agay Mene

We observed a total of 1325 waterbirds plus gulls, terns and shorebirds on the two surveys representing at least 23 species (Table 1). The most common species were mallard, scaup, American wigeon, Barrow's goldeneye and bufflehead. Diving ducks

represented approximately 56% of all observed ducks. Slightly more birds were observed during the first survey than the second. Other non-waterbird species observed included bald eagle, northern harrier, osprey, rusty blackbird, red-winged blackbird and ruffed grouse.

Table 1: Total birds observed on each survey at Agay Mene on May 15 and 31, 2007.

	Survey 1	Survey 2	Total Birds Observed
Mallard	83	98	181
Scaup	75	104	179
American wigeon	75	53	128
Barrow's goldeneye	49	79	128
Bufflehead	77	48	125
Shorebirds	60	35	95
Unidentified duck	48	31	79
Green-winged teal	57	19	76
Ring-necked duck	49	10	59
Unidentified goldeneye	35	6	41
Unidentified diver	14	17	31
Unidentified yellowlegs	17	13	30
Unidentified gull	14	14	28
Common loon	2	15	17
Mew gull	9	7	16
Common goldeneye	12	2	14
Red-necked grebe	2	11	13
Northern shoveler	8	4	12
Bonaparte's gull	10	1	11
White-winged scoter	0	11	11
Northern pintail	7	0	7
Canada goose	1	5	6
Red-breasted merganser	6	0	6
Trumpeter swan	6	0	6
Unidentified merganser	2	4	6
Unidentified scoter	0	5	5
Scaup/ring-necked duck	4	0	4
Unidentified tern	0	3	3
Blue-winged teal	2	0	2
Surf scoter	0	2	2
Unidentified loon	0	2	2
Herring gull	1	0	1
Unidentified grebe	0	1	1
	725	600	1325

We estimated a total of 227 IBP within Agay Mene (Table 2). A total of 14 species are believed to breed here. The breeding waterbird community is dominated by five species: bufflehead, mallard, American wigeon, Barrow's goldeneye and scaup which account for 79% of all IBP. Average IBP density is 1.39 IBP/km² with the highest density within a grid cell reaching 5.68 IBP/km². Highest densities occurred on the south end of White Mountain and near Tarfu and lower Snafu Lakes (Figure 4). There were no IBP observed in the northern portion of the park on White Mountain.

Table 2: Total IBP and IBP density for each species within Agay Mene from surveys on May 15 and 31, 2007. IBP density is measured in IBP/km².

	IBP	IBP Density
Mallard	52	0.32
Bufflehead	43	0.27
American wigeon	36	0.22
Barrow's goldeneye	26	0.16
Scaup	22	0.14
Green-winged teal	15	0.09
Common loon	7	0.04
Common goldeneye	6	0.04
Red-necked grebe	5	0.03
Northern pintail	4	0.03
Unidentified goldeneye	3	0.02
Northern shoveler	2	0.01
Unidentified merganser	2	0.01
Trumpeter swan	1	0.01
Unidentified diver	1	0.01
Unidentified loon	1	0.01
White-winged scoter	1	0.01
	227	1.39

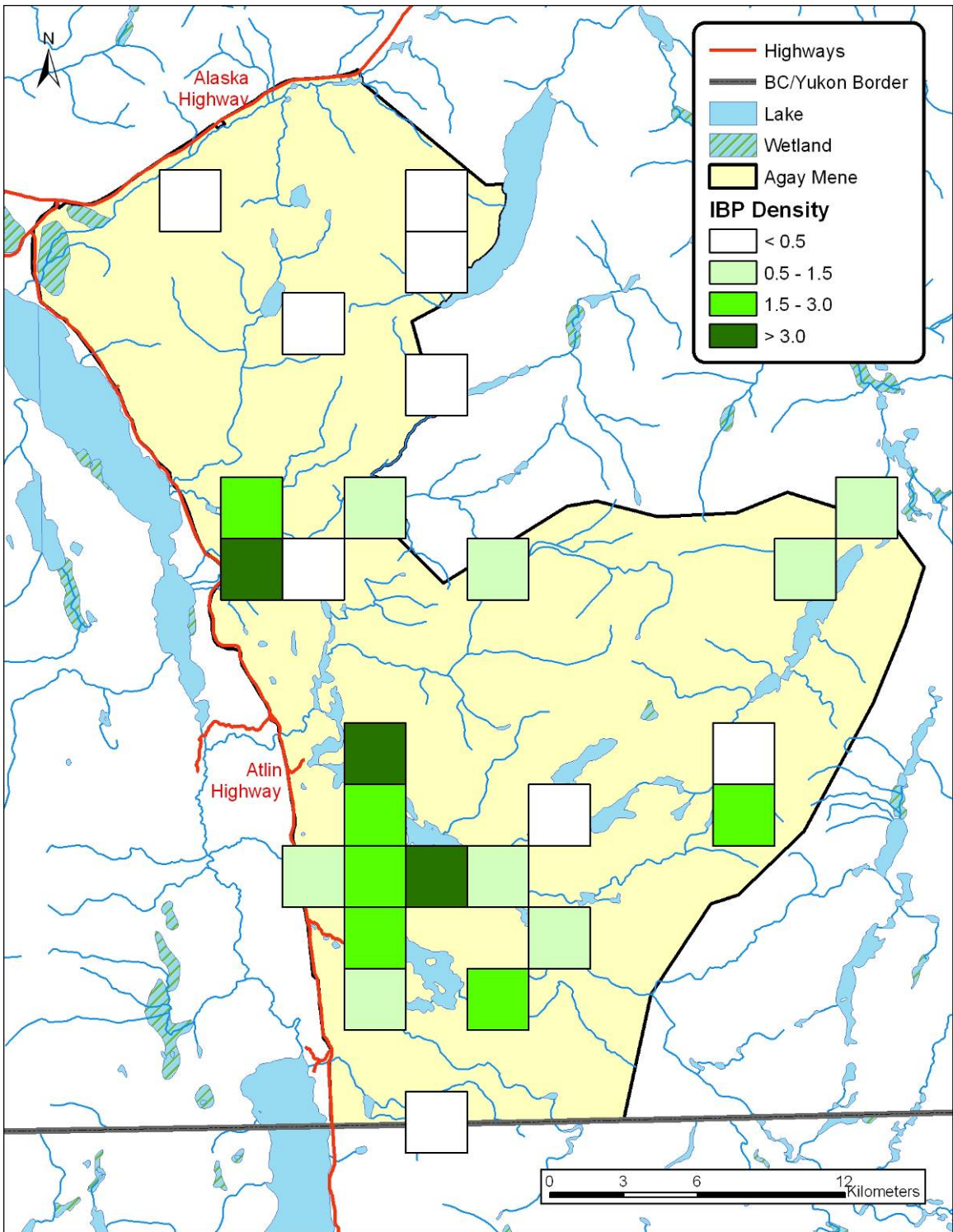


Figure 4: Distribution of waterbird IBP within Agay Mene as estimated by surveys conducted by Ducks Unlimited Canada on May 15 and 31, 2007. IBP density is measured in IBP/km².

Kusawa

A total of 913 waterbirds, including gulls, terns and shorebirds, of at least 20 species was observed in Kusawa (Table 3). The most common species were ring-necked duck, scaup and mallard. Very few birds were observed on Kusawa Lake itself, preferring river deltas and small ponds. Other bird species observed included bald eagle, belted kingfisher and red-winged blackbird.

Table 3: Total birds observed on each survey at Kusawa on May 16 and June 1, 2007.

	Survey 1	Survey 2	Total Birds Observed
Ring-necked duck	71	104	175
Scaup	53	64	117
Mallard	63	47	110
Green-winged teal	65	25	90
American wigeon	43	37	80
Shorebirds	12	57	69
Bufflehead	41	27	68
Unidentified diver	25	16	41
Barrow's goldeneye	9	26	35
Northern shoveler	26	7	33
Unidentified yellowlegs	16	5	21
Unidentified goldeneye	6	10	16
Unidentified gull	10	3	13
Common goldeneye	9	0	9
Unidentified duck	7	1	8
Pacific loon	0	4	4
Trumpeter swan	3	1	4
Unidentified tern	3	1	4
Blue-winged teal	0	3	3
Unidentified grebe	2	1	3
Bonaparte's gull	1	1	2
Northern pintail	1	1	2
Unidentified merganser	0	2	2
Canada goose	0	1	1
Mew gull	1	0	1
Red-necked grebe	0	1	1
Unidentified dabbler	0	1	1
	467	446	913

We estimated a total of 169 IBP of 14 species within Kusawa (Table 4). Mallards are the most common breeding waterbird while bufflehead and green-winged teal are also relatively common. Dabbling ducks represent a total of 56% of all breeding waterbirds.

Average waterbird IBP density is 0.48 IBP/km² although the highest grid density was 2.48 IBP/km². Waterbird IBP were not evenly distributed across Kusawa with 73% of all IBP found in two grid cells over the Mendenhall wetlands along the northern border of the park (Figure 5).

Table 4: Total IBP and IBP density for each species within Kusawa from surveys on May 16 and June 1, 2007. IBP density is measured in IBP/km².

	IBP	IBP Density
Mallard	46	0.13
Bufflehead	29	0.08
Green-winged teal	22	0.06
American wigeon	17	0.05
Ring-necked duck	14	0.04
Scaup	12	0.03
Northern shoveler	7	0.02
Barrow's goldeneye	5	0.01
Unidentified diver	4	0.01
Common goldeneye	3	0.01
Unidentified goldeneye	3	0.01
Blue-winged teal	2	0.01
Pacific loon	2	0.01
Northern pintail	1	< 0.01
Red-necked grebe	1	< 0.01
Trumpeter swan	1	< 0.01
	169	0.48

DISCUSSION

Both Agay Mene and Kusawa have localized regions that provide productive waterbird habitat. In general, the more suitable habitat available the more birds use an area. Agay Mene and Kusawa are limited to small pockets of suitable habitat due to the extreme variations in topography within the park boundaries. Highest IBP densities in Kusawa were found in low-lying areas near the Mendenhall River that allow wetland complexes to form. Within Kusawa, where rivers flow into or out of lakes also have higher IBP densities as wetlands form along the river edges although the sample size of these types of habitats were small in this study. Agay Mene has less variation in topography allowing higher wetland density over more area and thus more waterbird habitat. This is evident with highest IBP densities occurring in lower elevation areas of the park with high wetland density.

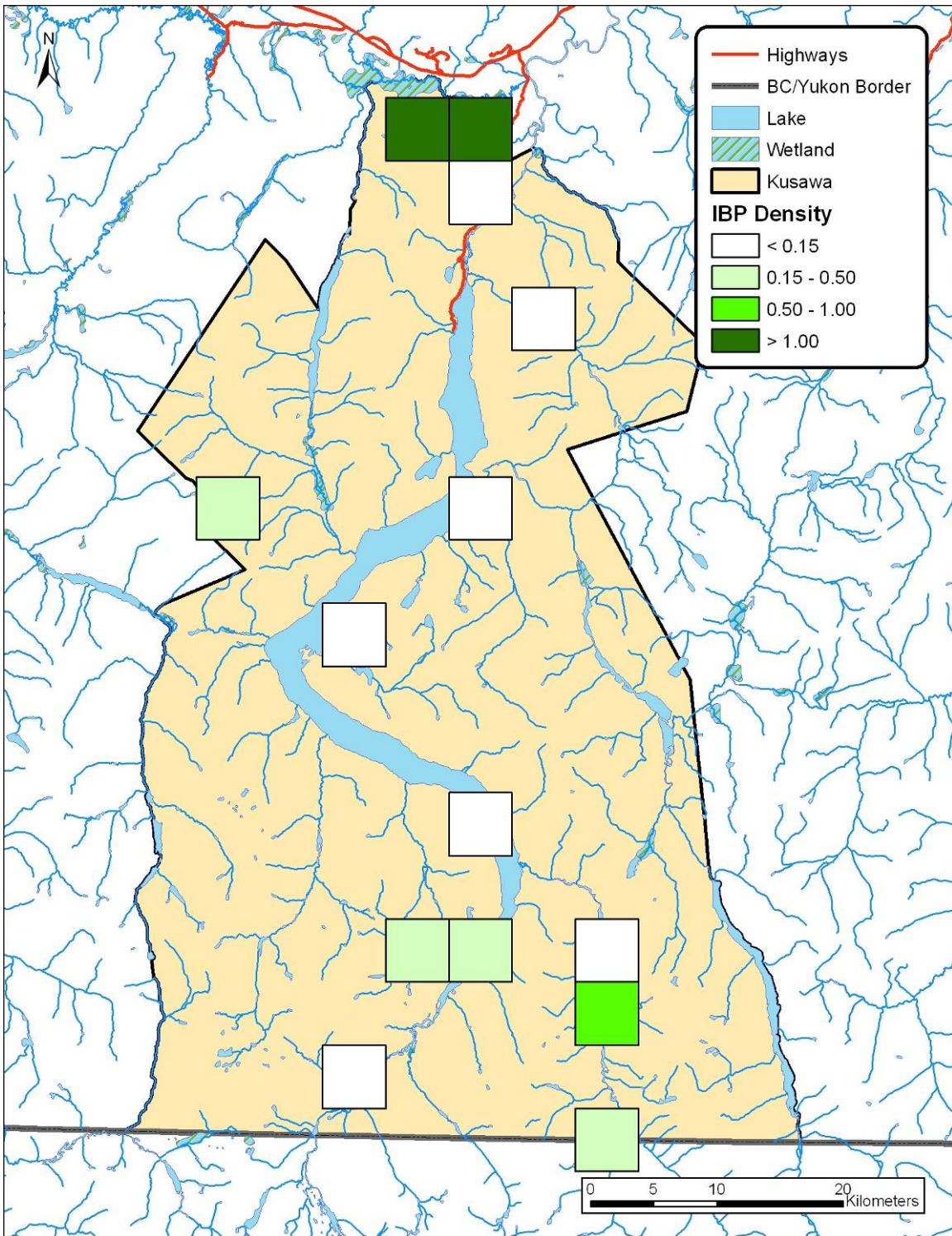


Figure 5: Distribution of waterbird IBP within Kusawa as estimated by surveys conducted by Ducks Unlimited Canada on May 16 and June 1, 2007. IBP density is measured in IBP/km².

Land elevation also impacts IBP numbers within the parks by influencing ice melt of wetlands in spring. During our surveys in mid-May many of the higher elevation wetlands were still predominantly ice-covered preventing use by waterbirds. This included the high elevation plateau area west of Kusawa Lake and wetlands on White Mountain in Agay Mene. However, these high elevation wetlands may not provide suitable nesting habitat due to extreme weather and limited cover.

Although some regions within each park were not directly used by breeding waterbirds, these areas may play an important role in protecting the entire watershed and the wetlands used by waterbirds. Maintaining the integrity of the park's hydrology, the movement of water across the landscape, is important to ensuring waterbird habitat remains at its current level. For example, higher elevation wetlands can provide a source of water for the lower elevation wetlands throughout the summer months thereby stabilizing water levels. Maintaining the hydrology within the parks will help ensure the goals of each park, as stated in the Final Agreements with the affected First Nations, are reached.

Comparison of the total number of birds observed and the number of IBP in each park shows a large number of birds were not considered to be breeding within either park. This suggests that many birds were using these areas as a migratory stopover site on their way to breeding areas further north in areas that likely include Alaska, Yukon or the Mackenzie delta region of the Northwest Territories. Species such as scaup and ring-necked duck were most likely to be using both parks as migratory stopover sites. Common breeding species like mallard, bufflehead, green-winged teal and American wigeon were not observed migrating in as high proportions as scaup and ring-necked ducks. Both scaup and ring-necked ducks begin nesting later in the season than most other species so their migratory period overlapped with our surveys.

Scaup populations have been steadily declining since the mid-1980's (U.S. Geological Survey 1999) and have reached an all-time low of 3.39 million birds with the majority of the decline occurring in the western boreal forest (Austin et al. 2006). Agay Mene and Kusawa are used by scaup for breeding and spring migration. Scaup are the second most abundant species in both parks. At a landscape level where wetlands are being altered by industrial development and affected by climate change and the North

Pacific Decadal Oscillation (Austin et al. 2006) it is imperative to maintain any wetland habitat used by these species of concern.

In addition to wetland habitat many waterbirds, particularly dabbling ducks such as mallards and teal, require adjacent upland habitat for nesting. Given that the most common nesting waterbirds in both parks are dabbling ducks and cavity-nesting bufflehead and goldeneye, management plans can be implemented knowing the generalities of nesting requirements for these species.

Ducks Unlimited Canada is happy to provide information on breeding waterbirds to the steering committees for both Agay Mene and Kusawa. We will continue to be available to provide any further information and expertise to the steering committee as the process of creating a management plan for each park continues.

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