

1994 WATERFOWL BREEDING PAIR SURVEY
YUKON FLATS NATIONAL WILDLIFE REFUGE

MBM
RFB

Mark Bertram, U.S. Fish and Wildlife Service, Yukon Flats National Wildlife Refuge (NWR), 101 12th Ave. Rm 110 Fairbanks, Alaska 99701 (907) 456-0446.

SUMMARY

The waterfowl breeding population estimate for the refuge (stratum 4) is 581,111. This estimate is down 27% from the ten year mean. Dabbling species estimates decreased except northern shoveler and pintail when compared with the ten year mean. Estimates for total diver species decreased compared with the ten year mean except canvasback which increased slightly.

BACKGROUND

Aerial breeding pair surveys were first initiated on the Yukon Flats NWR in 1952 (Lensink 1965). The Division of Migratory Bird Management (MBM) standardized methods for the survey in 1956 and has since conducted the survey annually in late May on the Yukon Flats, known as Stratum 4 (Figure 1). Yukon Flats NWR staff recognized in 1983 that the traditional flight lines sampled under represented both refuge lands and available wetland habitats in Stratum 4 (McLean 1992). As a result the refuge initiated an expanded aerial breeding pair survey in 1984 with the primary objective to monitor annual waterfowl breeding pair trends and waterfowl density distributions on Service lands. The survey increased representation of Service lands and sample size by about 50% (Figure 1). This survey continued until 1989 when MBM, in cooperation with the Division of Realty and Refuges, initiated a three year study to conduct an intensive breeding pair survey designed to specifically delineate breeding duck distributions. The impetus to gather this information coincided with findings which indicated private and Service lands in the southern Yukon Flats had high potential for oil and gas reserves. This systematic expanded survey covered over 4,300 kilometers (km) and provided managers with detailed waterfowl distribution data for reducing impacts of potential oil exploration and development to waterfowl and a means of evaluating private lands within the refuge for acquisition priority (Figure 2) (Platte and Butler 1992). In 1993 refuge staff rated the expanded breeding pair survey high priority during a biological review and the survey was initiated again in 1994.

STUDY AREA/METHODS

Expanded aerial waterfowl breeding surveys were conducted May 31 and June 1 on the Yukon Flats NWR according to methods outlined in "Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys," (USDI-CDE/CWS 1987, as revised).

The area surveyed is the Yukon Flats Production Area or Stratum 4 and includes 30 standard survey transects, each 26 km long and .4 km wide. The transects, which total 772 km, were initially randomly sampled in 1984 (Figure 1). Each transect was subdivided into four segments, each 6.4 kilometers in length.

A Cessna 185 was used to fly transects in a north/south direction at ground speeds not exceeding 178 km/hr and at elevations between 30.5 and 45.7 meters above ground level. Survey crew included an experienced pilot/biologist and an inexperienced observer/biologist. Waterfowl were recorded by species and classified according to standard operating procedures.

A training flight was conducted in Minto Flats May 30 to re-familiarize flight crew with survey techniques and aerial waterfowl identification.

Breeding population estimates were derived using the computation format offered in the standard operating procedure.

RESULTS

The waterfowl breeding population estimate for the refuge (stratum 4) is 581,111 and summarized by species in Table 1. This estimate is down 27% from the ten year mean. Table 2 offers a comparison between refuge and MBM (Conant and Groves 1994) surveys conducted in 1994 and previous years.

Refuge surveys indicated 1994 estimates decreased for dabbling species except northern shoveler and pintail when compared with the 1984-1994 mean (Table 2). Estimates for total diver species decreased in 1994 when compared with 1984-1994 means except canvasback which increased slightly. Refuge staff included an experienced pilot/biologist and a less experienced observer/biologist. Data was analyzed and compared for number and species detected by each observer. No significant differences in total observations or between species were noted.

The 1994 MBM (Conant and Groves 1994) survey estimates followed similar long term trends for dabblers, divers, and total ducks when compared with refuge estimates except decreases were noted for northern pintail and canvasback. Although similar patterns of decrease were observed in both surveys, MBM total estimates were substantially higher when compared to refuge estimates. MBM estimates were higher than refuge estimates for dabblers, divers, and total birds by 45%, 32%, and 36% respectively. The MBM survey, which was conducted May 22, estimated 911,300 total birds in Stratum 4.

DISCUSSION

Considering the increased sample size, increased sampling of lower density habitats, and observer inexperience in the refuge survey, and differences in timing of the two surveys, it is not surprising that the refuge survey and the MBM survey differed substantially in 1994 as in previous years.

The dissimilarity in timing (10 days in 1994) is likely responsible for differences in diver estimates, specifically canvasbacks and scoters.

However, refuge 1984-1994 mean estimates are much closer to those estimated by Butler et al. from 1989-1991. The Butler et al. expanded survey systematically covered Stratum 4 and more than tripled coverage of previous surveys.

COSTS

The survey required 15.8 flight hours in 1994 for a total cost of \$2,022.40.

RECOMMENDATIONS

It is recommended that this survey continue in 1995 if funds are available. Information from this survey can supplement the existing MBM (Conant et al.) Stratum 4 survey. In addition, this survey is not on a regimented flight schedule and is more sensitive to waterfowl nesting phenology, and in some cases, may more accurately depict late arriving diver breeding pair species.

Since species such as pintail, scaup, and canvasback are still below historical nationwide averages and population goals established by the North American Waterfowl Management Plan have not yet been met, it is obligatory that the refuge continue to contribute to this historical data set.

LITERATURE CITED

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- Platte, R.M. and W.I. Butler. 1992. Aerial surveys and mapping of waterbird distribution and abundance for impact assessment of potential oil development on Yukon Flats National Wildlife Refuge, Alaska. U.S. Fish and Wildl. Serv. 12pp.
- U.S. Department of the Interior-Canadian Department of the Environment/Canadian Wildlife Service. 1987. Standard operating procedures for aerial waterfowl breeding ground population and habitat surveys. U.S. Fish and Wildl. Serv. Unpublished manual.

Figure 1. Aerial waterfowl breeding pair transects for Yukon Flats NWR and Division of Migratory Birds surveys, Stratum 4.

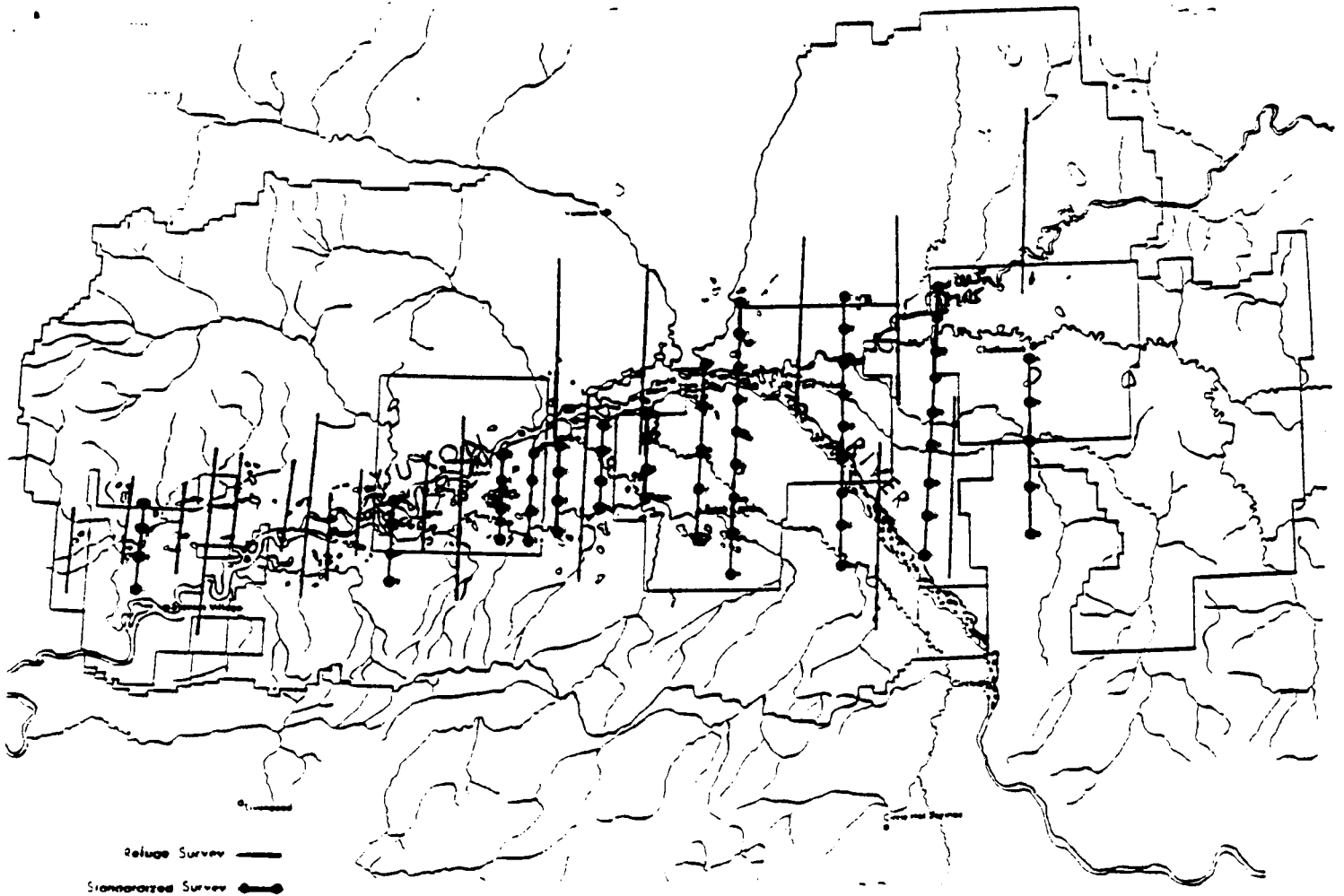


Figure 2. 1991 transects for Butler et al. breeding pair survey, Yukon Flats NWR, Stratum 4.

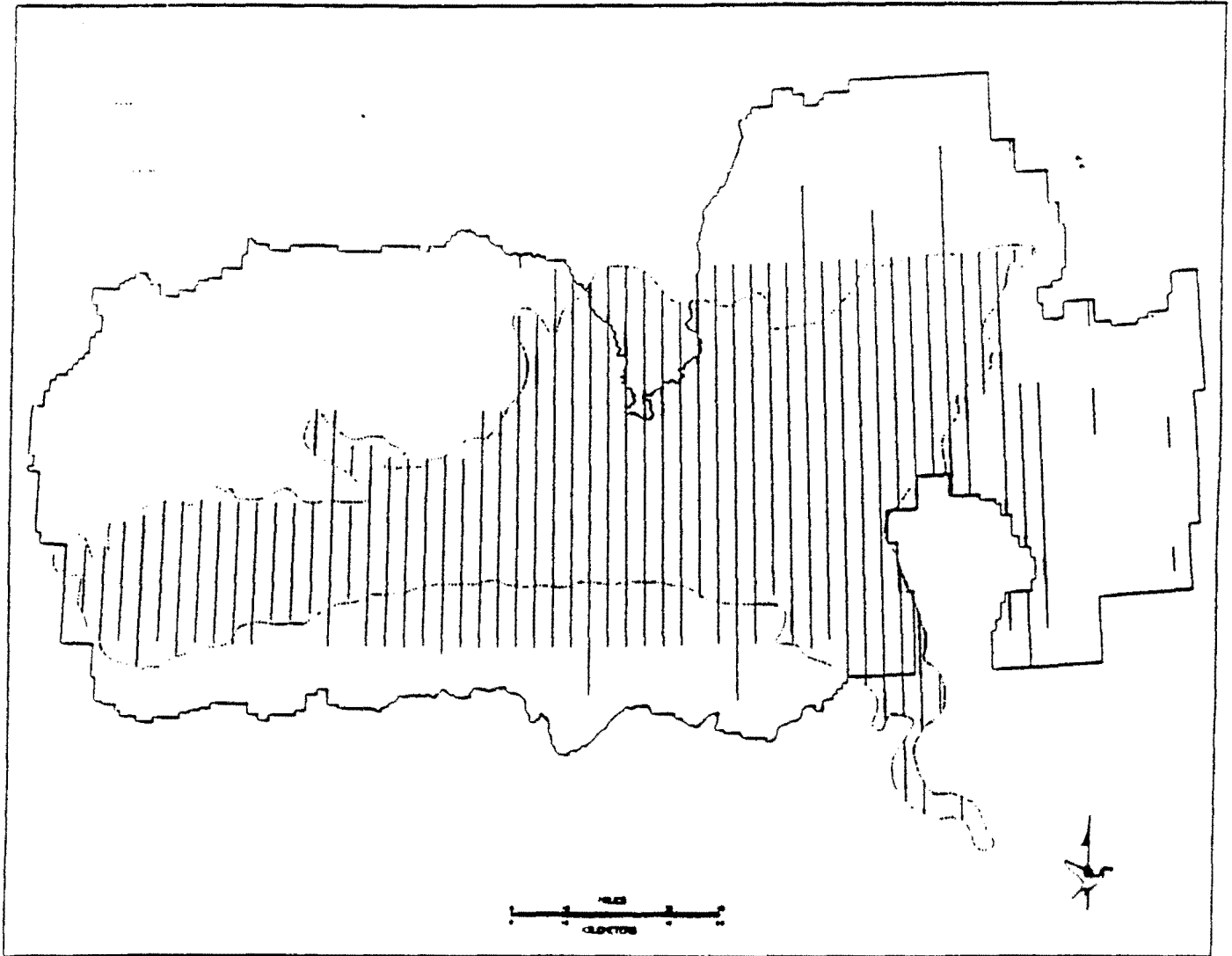


Table 1. Waterfowl breeding population survey, Yukon Flats NWR, Stratum 04 (30 segments), May 31 - June 1, 1994.

Species	Drakes ¹	Pairs	Grouped Birds	Indicated Total Birds (T)	T/S	Visibility Ratio (V)	Population Index (P)	P/1000
Mallard		63		126	1.0862	3.57	41880	41.9
Gadwall		1		2	0.0172	3.04	565	0.6
Am. Wigeon		77	15	169	1.4569	3.65	57431	57.4
G.W. Teal		42		84	0.7241	8.88	69444	69.4
N. Shoveler		32	7	171	1.4741	3.35	53333	53.3
N. Pintail		106	142	354	3.0517	2.51	82725	82.7
Redhead ²						3.11		
Canvasback		76	85	237	2.0431	2.43	53619	53.6
Scaup ³	47	351	274	1023	3.8190	1.32	173346	173.3
Ringneck ⁴		1		2	0.0172	4.02	747	0.7
Goldeneye		5		10	0.0862	3.61	3361	3.4
Bufflehead		22		44	0.3793	1.36	7619	7.6
Oldsquaw		2		4	0.0345	1.99	741	0.7
Scoter		115	131	361	3.1121	1.08	36300	36.3
Total	47	943	654	2587			581111	580.9

¹ All drakes included with pairs except scaup

² = Drakes not doubled in arriving at indicated total birds (T)

P = A (T/S) V

A = Square km in stratum = 17,377 (10,800 mi²)

S = Square km in sample = 187 (116 mi²)

note: normally S = 194 km (120 mi²) however data was lost on 7 km for transects 11 and 12

Table 2. Comparison of annual and historic waterfowl breeding pair population estimates for Yukon Flats Production Area, Stratum 4, 1984-1994¹.

Yukon Flats Production Area (Stratum 4)	1994 ANNUAL ESTIMATES AND % CHANGE FROM 1984-1994 MEANS		1984-1994 MEAN ESTIMATES		
	Species	Yukon Flats NWR 5\31-6\1	Migratory Bird 5\22	Yukon Flats NWR ² 1984-1989 1994	Migratory Bird ³ (Conant et al.) 1984-1994
() % change from 1984-94 mean					
Mallard	(-33) 41.9	(-33) 52.1	62.7	77.7	64.2
Gadwall	(-89) 0.6	-- 0.0	5.7	1.3	1.0
American Wigeon	(-53) 57.4	(-21) 155.7	123.3	194.7	58.6
Green-winged Teal	(-13) 69.4	(- 4) 95.9	79.4	99.8	33.2
Northern Shoveler	(+28) 53.3	(+37) 166.9	41.7	121.7	47.5
Northern Pintail	(+98) 82.7	(-61) 82.7	41.7	214.3	56.1
subtotal dabblers	(-14) 305.3	(-22) 553.3	354.5	709.5	260.7
Redhead	-- 0.0	(-82) 0.8	4.1	4.4	1.1
Canvasback	(+13) 53.6	(-21) 45.3	47.4	57.2	28.7
Scaup sp.	(-34) 173.3	(-21) 268.1	262.8	340.0	114.2
Ringnecked Duck	(-88) 0.7	(-20) 9.8	5.9	10.2	2.7
Goldeneye sp.	(-82) 3.4	(+12) 16.6	19.1	14.8	6.5
Bufflehead	(-61) 7.6	(-45) 8.0	19.7	14.5	7.2
subtotal divers	(-34) 238.6	(-21) 348.6	359.0	441.1	160.0
Oldsquaw	(-89) 0.7	(-98) 0.5	6.5	23.9	1.6
Scoter sp.	(-54) 36.3	(-83) 8.6	78.7	51.3	36.2
Merganser sp.	-- 0.0	(-90) 0.3	1.9	3.0	0.5
subtotal misc.	(-58) 37.0	(-88) 9.4	87.1	78.2	38.2
TOTAL	(-27) 580.9	(-26) 911.3	800.6	1228.8	458.9

¹ Surveys conducted by Yukon Flats NWR, Fairbanks, and Division of Migratory Birds, Juneau/Anchorage

² Surveyed by refuge staff 1984-1989, 1994 (772 km sampled).

³ Surveyed by Division of Migratory Birds, Juneau, 1984-1994 (515 km sampled).

⁴ Surveyed by Division of Migratory Birds, Anchorage, 1989-1991 (1500 km sampled 1989-90, 4,300 km sampled in 1991).