

MEMORANDUM

To: Atlantic Flyway Technical Section, Mississippi Flyway Technical Section, USFWS National Wildlife Refuge System (Regions 4 & 5), USFWS Law Enforcement (Regions 4 & 5)

From: Pat Devers, Science Coordinator Black Duck Joint Venture

Subj.: Preliminary Report - Black Duck Winter Banding program, 2011

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The Black Duck Joint Venture (BDJV) in cooperation with Partners (Table 1) in the Mississippi and Atlantic Flyways Councils, the National Wildlife Refuge System (Regions 4 & 5), U.S. Geological Survey, and Canada initiated a 5-year pilot project to assess a 2-season (pre- and post-hunting season) banding program to estimate black duck seasonal survival rates. The overall goal of this effort is to improve our ability to model black duck population dynamics and identify limiting factors that can be mitigated through habitat and harvest management. Our objectives are:

1. Use historic banding data to design protocols (i.e., season specific sample sizes and spatial allocation) that will provide point estimates of seasonal survival and harvest rates with annual coefficient of variation $\leq 10\%$ and 5-year mean coefficient of $\leq 5\%$.
2. Implement 5-year pilot effort to test field and data analysis protocols. Resulting banding data will be used to evaluate success of field operations (i.e., meeting banding quotas), assumptions, data quality and applicability.
3. Use data from pilot effort to estimate required post-season banding sample needed to measure density dependent changes in post-season survival.



4. Revise protocols and make recommendations for operational implementation of 2-season banding program for American black ducks.

The pilot project started in January 2010 (banding season January—February) and the second year occurred from January — March 2011. An annual banding goal of 3,000 black ducks was established based on analysis of historic banding data. This goal was stepped down to regional goals for Canada (western region [i.e., Ontario], central region [i.e. Quebec], and eastern region [i.e., Maritimes]), North Atlantic U.S., South Atlantic U.S., and Mississippi Flyway States.

Partners banded 2,382 and 2,933 black ducks in 2010 and 2011, respectively (Table 2). The distribution of black duck bandings across regions was similar to desired distribution, except in central Canada where winter banding has not been attempted (Table 2). New York (i.e., New York Department of Environmental Conservation and Montezuma National Wildlife Refuge) banded the most black ducks in 2010 (517) and 2011 (528) (Tables 3 and 4). Partners also banded 267 and 185 black duck-mallard hybrids (MBDH) in 2010 and 2011, respectively (Table 5). The banding protocol was revised for the 2011 season to reflect a desire to classify hybrids in 1 of 4 potential categories: black duck-dominant (ABDX), intermediate (MBDX), undetermined (MBDH), and mallard- dominant (MALX). Partners banded 483 black duck- dominant hybrids (ABDX), 41 intermediate hybrids (MBDX), and 39 mallard- dominant hybrids (MALX) in 2011 (Tables 6—8). The North Atlantic region had the highest ratio of hybrids to ABDU (1.9:1) followed by the Mississippi Flyway (1.18:1; Table 9). Partners banded 2,765 and 7,901 mallards in 2010 and 2011, respectively (Table 10). The Mississippi Flyway (i.e., Ohio, Kentucky, and Tennessee) banded the most mallards in both years. Adult males (i.e., after-second year males) comprised the greatest number of banded birds across all species; juvenile females (i.e., second-year females) comprised the fewest number of banded birds across all species (Table 11). A total of 139 winter banded

black ducks have been recovered since January 2010 (Table 12). Initial estimates of black duck seasonal survival will be available by February 2012.

The BDJV is nearing completion of a 'Handbook of black duck banding techniques' and a revision of the species identification cue cards developed in 2010. Both products should be available prior to the 2012 winter banding season and will be provided to all partners when available.

For questions, comments, or inquiries please contact:

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Table 1. List of partners contributing to the post-hunting season banding operations as part of the Black Duck Joint Venture 'Pilot Study to Evaluate a Two-Season Banding Program to Estimate Black Duck Seasonal Survival Rates'.

Partner

Canadian Wildlife Service – Ontario Region

Ontario Ministry of Natural Resources

Canadian Wildlife Service – Atlantic Region

Maine Department of Inland Fisheries and Wildlife

Moosehorn National Wildlife Refuge

U.S. Geological Survey, Patuxent Wildlife Research Center (Orono, ME).

Massachusetts Division of Fisheries and Wildlife

Parker River National Wildlife Refuge

Rhode Island Division of Fish and Wildlife

Rhode Island National Wildlife Refuge Complex

Connecticut Department of Environmental Protection

New York Department of Environmental Conservation

Montezuma National Wildlife Refuge

Pennsylvania Game Commission

New Jersey Division of Fish and Wildlife

E. B. Forsythe National Wildlife Refuge

Cape May National Wildlife Refuge

Delaware Department of Natural Resources and Environmental Control

Bombay Hook National Wildlife Refuge

Prime Hook National Wildlife Refuge

Maryland Wildlife and Heritage Service

Chesapeake Bay National Wildlife Refuge Complex

Table 1. Continued.

Partner
Virginia Department of Game and Inland Fisheries
Chincoteague National Wildlife Refuge
Eastern Shore of Virginia and Fisherman Island National Wildlife Refuges
Eastern Virginia Rivers National Wildlife Refuge Complex
North Carolina Wildlife Resource Commission
Mackay Island National Wildlife Refuge
Ohio Department of Natural Resources
Kentucky Department of Fish and Wildlife Resources
Tennessee National Wildlife Refuge

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Table 2. Summary of black ducks (ABDU) banded during post-hunting season banding operations, 2010-2011.

Year	Region	ASYF	ASYM	SYF	SYM	UNKN	Total	Distribution	
								% of Total	Goal
2010	ECAN	25	75	47	50	0	197	0.08	0.13
2010	WCAN	16	35	11	20	0	82	0.03	0.04
2010	MF	28	41	31	18	1	60	0.03	0.06
2010	NATL	328	755	237	331	0	1651	0.69	0.54
2010	SATL	59	157	88	87	1	392	0.16	0.25
2010 Total		456	1063	414	506	2	2382		
2010 % of Sample		0.19	0.45	0.17	0.21	0.00	1.02		
2011	ECAN	23	38	21	33	0	115	0.04	0.13
2011	WCAN	12	24	30	25	0	91	0.03	0.04
2011	MF	17	39	35	24	0	115	0.04	0.06
2011	NATL	422	856	337	417	14	2046	0.70	0.54
2011	SATL	120	199	136	111	0	566	0.19	0.25
2011 Total		594	1156	559	610	14	2933		
2011 % of Sample		0.20	0.39	0.19	0.21	0.00	1.00		

Table 3. Number of black duck bandings by region, and province/state in 2010.

Year	Species	Region	Prov./State	Area code	cohort					Total
					ASYF	ASYM	SYF	SYM	UNKN	
2010	ABDU	ECAN	NB	56	0	0	0	0	0	0
2010	ABDU	ECAN	NF	57	0	2	0	0	0	2
2010	ABDU	ECAN	NS	65	6	22	34	41	0	103
2010	ABDU	ECAN	PE	75	19	51	13	9	0	92
2010	ABDU	MF	KY	39	2	3	8	6	0	19
2010	ABDU	MF	OH	66	3	23	7	7	1	41
2010	ABDU	MF	TN	82	0	0	0	0	0	0
2010	ABDU	NATL	CT	18	23	15	16	5	0	59
2010	ABDU	NATL	ME	44	34	117	28	57	0	236
2010	ABDU	NATL	MA	47	57	205	34	33	0	329
2010	ABDU	NATL	NJ	59	89	129	36	42	0	296
2010	ABDU	NATL	NY	61	95	190	90	142	0	517
2010	ABDU	NATL	PA	72	27	77	28	35	0	167
2010	ABDU	NATL	RI	77	3	22	5	17	0	47
2010	ABDU	SATL	DE	21	23	57	36	35	0	151
2010	ABDU	SATL	MD	46	31	91	48	50	1	221
2010	ABDU	SATL	NC	63	0	0	1	0	0	1
2010	ABDU	SATL	VA	88	5	9	3	2	0	19
2010	ABDU	WCAN	ON	68	16	35	11	20	0	82

Table 4. Number of black duck bandings by region, and province/state in 2011.

Year	Species	Region	Prov./State	Area code	cohort					Total
					ASYF	ASYM	SYF	SYM	UNKN	
2011	ABDU	ECAN	NB	56	3	3	6	16	0	28
2011	ABDU	ECAN	NF	57	0	0	0	0	0	0
2011	ABDU	ECAN	NS	65	20	35	15	17	0	87
2011	ABDU	ECAN	PE	75	0	0	0	0	0	0
2011	ABDU	MF	KY	39	6	23	16	10	0	55
2011	ABDU	MF	OH	66	0	0	0	0	0	0
2011	ABDU	MF	TN	82	11	16	19	14	0	60
2011	ABDU	NATL	CT	18	31	56	22	29	0	138
2011	ABDU	NATL	ME	44	39	87	35	48	0	209
2011	ABDU	NATL	MA	47	148	201	62	68	12	491
2011	ABDU	NATL	NJ	59	65	185	68	77	0	395
2011	ABDU	NATL	NY	61	103	218	85	120	2	528
2011	ABDU	NATL	PA	72	22	67	49	63	0	201
2011	ABDU	NATL	RI	77	14	42	16	12	0	84
2011	ABDU	SATL	DE	21	18	53	46	26	0	143
2011	ABDU	SATL	MD	46	55	70	35	40	0	200
2011	ABDU	SATL	NC	63	20	32	25	17	0	94
2011	ABDU	SATL	VA	88	27	44	30	28	0	129
2011	ABDU	WCAN	ON	68	12	24	30	25	0	91

Table 5. Summary of unclassified hybrid (MBDH) banded during post-hunting season banding operations, 2010-2011.

Year	Region	ASYF	ASYM	SYF	SYM	UNKN	Total	Prop.
2010	ECAN	1	8	5	13	0	27	0.10
2010	WCAN	0	2	0	1	1	4	0.01
2010	MF	5	56	6	24	0	13	0.05
2010	NATL	18	140	19	30	0	207	0.78
2010	SATL	4	6	1	5	0	16	0.06
2010 Total		28	212	31	73	1	267	
2010 % of Sample		0.10	0.79	0.12	0.27	0.00	1.29	
2011	ECAN	0	1	0	0	0	1	0.01
2011	WCAN	1	0	2	2	0	5	0.03
2011	MF	0	0	1	3	0	4	0.02
2011	NATL	43	103	9	14	2	171	0.92
2011	SATL	0	2	1	1	0	4	0.02
2011 Total		44	106	13	20	2	185	
2011 % of Sample		0.24	0.57	0.07	0.11	0.01	1.00	

Table 6. Summary of black duck dominant hybrids (ABDX) banded during post-hunting season banding operations, 2010-2011.

Year	Region	ASYF	ASYM	SYF	SYM	UNKN	Total	Prop.
2011	ECAN	0	0	0	1	0	1	0.02
2011	WCAN	0	0	0	0	0	0	0.00
2011	MF	0	1	0	2	0	3	0.07
2011	NATL	3	13	3	8	0	27	0.66
2011	SATL	0	8	0	2	0	10	0.24
2011 Total		3	22	3	13	0	41	
2011 % of Sample		0.07	0.54	0.07	0.32	0.00	1.00	

Table 7. Summary of intermediate hybrids (MBDX) banded during post-hunting season banding operations, 2010-2011.

Year	Region	ASYF	ASYM	SYF	SYM	UNKN	Total	Prop.
2011	ECAN	0	0	0	1	0	1	0.02
2011	WCAN	0	0	0	0	0	0	0.00
2011	MF	0	1	0	2	0	3	0.07
2011	NATL	3	13	3	8	0	27	0.66
2011	SATL	0	8	0	2	0	10	0.24
2011 Total		3	22	3	13	0	41	
2011 % of Sample		0.07	0.54	0.07	0.32	0.00	1.00	

Table 8. Summary of mallard dominant hybrids (MALX) banded during post-hunting season banding operations, 2010-2011.

Year	Region	ASYF	ASYM	SYF	SYM	UNKN	Total	% of Total
2011	ECAN	0	2	0	0	0	2	0.05
2011	WCAN	0	0	0	0	0	0	0.00
2011	MF	0	0	0	1	0	1	0.03
2011	NATL	4	15	8	4	0	31	0.79
2011	SATL	1	0	2	2	0	5	0.13
2011 Total		5	17	10	7	0	39	
2011 % of Sample		0.13	0.44	0.26	0.18	0.00	1.00	

Table 9. Ratio of non-target species banded to the number of banded black ducks, 2011. 'Hybrids' is the ratio of all hybrid categories to black ducks.

Region	Prov./State	Species					Hybrids
		ABDX	MBDH	MBDX	MALX	MALL	
ECAN	NB	0.14	0.00	0.04	0.00	0.04	0.18
ECAN	NF	.	.	.	.	.	0.00
ECAN	NS	0.15	0.01	0.00	0.02	1.08	0.18
ECAN	PE	.	.	.	.	.	0.00
	<i>Total</i>	<i>0.29</i>	<i>0.01</i>	<i>0.04</i>	<i>0.02</i>	<i>1.12</i>	<i>0.36</i>
MF	KY	0.31	0.00	0.00	0.00	76.71	0.31
MF	OH	.	.	.	.	.	0.00
MF	TN	0.73	0.07	0.05	0.02	9.57	0.87
	<i>Total</i>	<i>1.04</i>	<i>0.07</i>	<i>0.05</i>	<i>0.02</i>	<i>86.28</i>	<i>1.18</i>
NATL	CT	0.68	0.00	0.04	0.06	1.17	0.78
NATL	ME	0.02	0.10	0.04	0.00	1.34	0.16
NATL	MA	0.31	0.00	0.01	0.01	0.16	0.34
NATL	NJ	0.02	0.00	0.00	0.01	0.43	0.04
NATL	NY	0.00	0.28	0.00	0.00	1.80	0.28
NATL	PA	0.12	0.00	0.02	0.03	1.64	0.18
NATL	RI	0.05	0.00	0.01	0.06	5.08	0.12
	<i>Total</i>	<i>1.21</i>	<i>0.39</i>	<i>0.13</i>	<i>0.18</i>	<i>11.62</i>	<i>1.90</i>
SATL	DE	0.13	0.00	0.02	0.01	0.05	0.15
SATL	MD	0.41	0.00	0.04	0.02	0.34	0.47
SATL	NC	0.04	0.02	0.00	0.00	0.20	0.06
SATL	VA	0.00	0.02	0.00	0.00	0.03	0.02
	<i>Total</i>	<i>0.58</i>	<i>0.04</i>	<i>0.06</i>	<i>0.03</i>	<i>0.62</i>	<i>0.70</i>
WCAN	ON	0.11	0.05	0.00	0.00	5.70	0.16
	<i>Total</i>	<i>0.11</i>	<i>0.05</i>	<i>0.00</i>	<i>0.00</i>	<i>5.70</i>	<i>0.16</i>

Table 10. Summary of mallards banded during post-hunting season banding operations, 2010-2011.

Year	Region	ASYF	ASYM	SYF	SYM	UNKN	Total	% of Total
2010	ECAN	52	110	48	35	0	245	0.09
2010	WCAN	44	82	66	51	2	245	0.09
2010	MF	543	1314	3	2	0	1,840	0.67
2010	NATL	95	182	46	70	0	393	0.14
2010	SATL	12	12	9	9	0	42	0.02
2010 Total		746	1700	172	167	2	2,765	
2010 % of Sample		0.27	0.61	0.06	0.06	0.00	1.01	
2011	ECAN	29	36	16	14	0	95	0.01
2011	WCAN	57	116	155	191	0	519	0.07
2011	MF	1261	3148	203	181	0	4,793	0.61
2011	NATL	625	1050	366	349	7	2,397	0.30
2011	SATL	30	37	16	14	0	97	0.01
2011 Total		2002	4387	756	749	7	7,901	
2011 % of Sample		0.25	0.56	0.10	0.09	0.00	1.00	

Table 11. Sex and age composition of birds banded during post-hunting season operations, 2010-2011.

Species	Year	Cohort			
		ASYF	ASYM	SYF	SYM
ABDU	2010	0.18	0.44	0.17	0.21
ABDU	2011	0.20	0.40	0.19	0.21
	<i>Mean</i>	<i>0.19</i>	<i>0.42</i>	<i>0.18</i>	<i>0.21</i>
ABDX	2010	.	.	.	.
ABDX	2011	0.14	0.46	0.15	0.26
MBDH	2010	0.09	0.59	0.09	0.23
MBDH	2011	0.24	0.58	0.07	0.11
	<i>Mean</i>	<i>0.17</i>	<i>0.59</i>	<i>0.08</i>	<i>0.17</i>
MBDX	2010	.	.	.	.
MBDX	2011	0.07	0.54	0.07	0.32
MALX	2010	.	.	.	.
MALX	2011	0.13	0.44	0.26	0.18
MALL	2010	0.27	0.61	0.06	0.06
MALL	2011	0.25	0.56	0.10	0.09
	<i>Mean</i>	<i>0.26</i>	<i>0.59</i>	<i>0.08</i>	<i>0.08</i>
<i>Mean</i>		<i>0.17</i>	<i>0.51</i>	<i>0.13</i>	<i>0.19</i>

Table 12. Number of recoveries of post-hunting season banded birds by banding year, encounter year, cohort, and species.

Species	Total Recoveries														
	2010:2010					2010:2011					2011:2011				
	ASYF	ASYM	SYF	SYM	Total	ASYF	ASYM	SYF	SYM	Total	ASYF	ASYM	SYF	SYM	Total
ABDU	10	20	10	24	64	18	30	9	15	72	2	1	0	0	3
ABDX	.	.	.	.	.	.	.	.	.	.	0	1	0	0	1
MBDX	.	.	.	.	.	.	.	.	.	.	0	1	0	0	1
MBDH	2	4	2	3	11	1	1	0	3	5	0	0	0	0	0
MALX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
MALL	16	74	7	11	108	4	50	1	3	58	4	10	0	3	17