



2019-20
RESEARCH &
MANAGEMENT
REPORT

**Game Species
Conservation & Management**

Download additional sections at
mefishwildlife.com/wildlifereport



2019-20 RESEARCH & MANAGEMENT REPORT

Maine Department of Inland Fisheries and Wildlife protects and manages Maine's fish and wildlife and their habitats, promotes Maine's outdoor heritage, and safely connects people with nature through responsible recreation, sport, and science.

Game Species Conservation & Management

Game Mammal Conservation & Management

Meet The Game Mammal Group.....	1
White-Tailed Deer	3
Moose	21
Black Bear.....	28
Furbearers	38

Game Bird Conservation & Management

Meet The Game Bird Group.....	41
Resident Game Birds	42
Migratory Game Birds.....	47

Download additional sections at
mefishwildlife.com/wildlifereport

- » Habitat Conservation & Management
- » Regional Wildlife Management
- » Endangered and Threatened Species Conservation & Management
- » Non-Game Mammals Conservation & Management
- » Beginning with Habitat Updates
- » Bird Conservation & Management
- » Reptile, Amphibian, and Invertebrate Conservation & Management

Compiled and edited by Diana Harper
and Lauren McPherson

Maine Department of Inland Fisheries & Wildlife

284 State Street
41 State House Station
Augusta, ME 04333-0041
207-287-5202

Project Funding

These studies are financed in part through Federal Aid in Wildlife Restoration Funds under Projects 88D and 87R and through State Wildlife Grants.

The Department of Inland Fisheries and Wildlife receives Federal funds from the U.S. Department of the Interior.

Accordingly, all Department programs and activities must be operated free from discrimination in regard to race, color, national origin, age or handicap. Any person who believes that he or she has been discriminated against should write to The Office of Equal Opportunity, U.S.



MAMMAL CONSERVATION & MANAGEMENT

The Mammal Group develops and oversees Maine’s mammal monitoring and management programs, assists with permit reviews, and provides technical assistance to policy makers and the public. We address public and departmental informational needs by designing and implementing research programs, assisting with strategic planning, contributing to the Department’s environmental

education efforts, and responding to public information requests. We also make regulatory recommendations on hunting and trapping of mammals to the Wildlife Division Director. We conduct all regulatory recommendations, planning, and research in close cooperation with regional wildlife biologists in the Wildlife Management section.

MEET THE GAME MAMMAL GROUP



Wally Jakubas, Ph.D.
**Wildlife Biologist and
Mammal Group Leader**

Wally supervises Mammal Group personnel, helps design, plan, and implement research projects and management programs, writes and manages Mammal Group contracts, and facilitates the daily work of Mammal Group biologists. He works with a dedicated team of biologists to restore the endangered New England cottontail population in Maine and in other states, and is the departmental spokesperson on New England cottontail, wolf, and cougar issues. He is an external member of the graduate faculties of the University of Maine and University of New Hampshire.



Nathan Bieber
Wildlife Biologist
Deer

Nathan oversees deer management system implementation, working closely with a team of regional biologists to make recommendations for allocating Any-Deer Permits and analyze hunter harvest and biological data. He also organizes MDIFW’s chronic wasting disease monitoring efforts and serves as the departmental spokesperson on white-tailed deer issues. Nathan and the Cervid Working Group are updating the deer management system to address the priorities described in the Department’s new Big Game Management Plan. He is also currently collaborating with a team of biologists on a deer winter survival study in Maine and New Brunswick.



Randy Cross
Wildlife Biologist
Black Bear

Randy oversees field work for collecting reproductive, survival, and density information on black bears. Randy supervises field crews that handle hibernating bears and the trapping and collaring of bears with GPS and VHF collars. Each year, Randy talks to hundreds of people about bear biology and natural history during his fieldwork. In the office, Randy compiles field data and oversees the processing and aging of moose, deer, and bear teeth. Randy, Jen, and the Bear Working Group are currently updating the bear management system to address the priorities described in the Department’s new Big Game Management Plan.



Lee Kantar
Wildlife Biologist

Moose

Lee oversees Maine’s moose management program. Lee’s work involves conducting aerial moose surveys, collecting and analyzing biological information from moose, making hunting permit recommendations, and serving as the departmental spokesperson on moose. Lee is heading up Maine’s portion of a moose survival study in cooperation with the University of New Hampshire and the New Hampshire and Vermont wildlife departments. The primary goal of this study is to determine which factors are affecting moose survival rates and how these factors are affecting moose population growth. Lee and the Cervid Working Group are currently updating the moose management system to address the priorities described in the Department’s new Big Game Management Plan.



Jennifer Vashon
Wildlife Biologist

Black Bear and Canada Lynx

Jennifer oversees the management of black bears and Canada lynx – a federally-threatened species. Jen designs and implements surveys and monitoring plans for bears and lynx and analyzes biological data for these species. She is the departmental spokesperson for lynx and bear, makes annual recommendations for harvesting black bears, and provides technical support on bear and lynx issues to stakeholders in Maine and other states. Jen also ensures that the Department meets its obligations under the federal Incidental Take Permit for Canada lynx.



Shevenell Webb
Wildlife Biologist

Furbearers and Small Mammals

Shevenell oversees the management of furbearers and small mammals, work that involves monitoring populations, recommending trapping regulations, conducting research on small mammals, and serving as the departmental spokesperson for furbearers. Shevenell is participating in several research projects with the University of Maine and University of New England, including a study to determine the most effective way to monitor Maine’s marten and fisher populations and a study to develop a new DNA survey technique for northern bog lemmings. She shares bat management responsibilities with Sarah Boyden, Assistant Regional Biologist in MDIFW’s Strong Office.

MAMMAL GROUP CONTRACT WORKERS AND VOLUNTEERS

Deer Project

- Connor White
- Anneliese Washakowski
- Ryan Bechtold
- Adri Bessenaire
- Laura Williams
- Jake Gaposchkin
- Derek Benedix
- Justine Rumaker
- Jordan Darley
- Tony Holzhauser
- Mikaela Kropp

Wendell Harvey

- Sue Kelly
- Holly Bates
- Gerry Lavigne
- Tim Lentz
- Roger Milligan
- Paul Campbell
- Braden Richard
- Eldon McLean
- Bill Carll
- Jeff Norment
- Michael Buyaskas

- Nick Bartholomew
- Carter Barthelman
- Nick Ferrauolo

Moose Project

- Andrew Jolin
- Kevin Richards
- Nick Bartholomew
- Carter Barthelman
- Jake Feener
- Alicia Miller
- Matt O’Neal
- Colby Slezak

- Cassandra Stiles
- Carl Tugend
- Kyle Watter

Bear Project

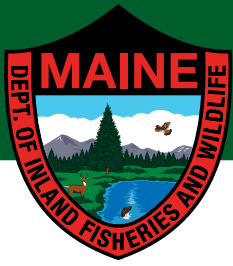
- Lisa Bates
- Jake Feener
- Zack Gadow
- Colleen Kostovick
- Ethan Lamb
- Evan Whidden
- Carl Tugend

Lynx Project

- Katherine Trickey

Furbearers

- Auden Lacorazza
- Tessa Shanteler
- Rebecca Cusick
- Sequoia Dixson
- Bradley Wilson
- Jeff Norment
- Carter Barthelman
- Nick Bartholomew
- Lisa Feener
- Bryn Evans



WHITE-TAILED DEER

Nathan Bieber

2018-2019 Deer Harvest

Season Dates and Structure

During the 2018 and 2019 seasons, Maine offered five different structured hunting seasons (Expanded Archery, Regular Archery, General Firearms, and two Muzzleloader seasons), giving hunters a total of 79 days each year to pursue white-tailed deer.



Harvest Information & Biological Data

PERMIT ALLOCATION

Total Allocation

In 2018, 84,745 Any-Deer Permits (ADP) were distributed among 22 Wildlife Management Districts (WMDs) to meet the adult doe harvest objective of 8,759. In 2019, 68,145 Any-Deer Permits (ADP) were distributed among 20 Wildlife Management Districts (WMDs) and two deer management subunits to meet the adult doe harvest objective of 7,966.

Allocation per WMD

Because many hunters elect not to harvest a doe or not to hunt, MDIFW applies an expansion factor to each WMD to ensure enough ADPs are issued to meet the district's doe removal goals. This expansion factor results in more permits being issued than the number of does expected to be harvested. An expansion factor of 10, for example, indicates that MDIFW must issue 10 permits to harvest one adult doe. The average statewide expansion factor is usually between six and seven with higher expansion factors in WMDs central and southern Maine WMDs.

2018

ADP allocations ranged from zero permits in WMDs 1, 4, 5, 10, 11, 19, and 28 to 12,375 in WMD 23.

The WMDs receiving the most ADPs per square mile were:

- WMD 24 40 permits/mi²
- WMD 22 25 permits/mi²
- WMD 21 22 permits/mi²
- WMD 20 16 permits/mi²
- WMD 23 16 permits/mi²

2019

ADP allocations ranged from zero permits in WMDs 1, 4, 5, 7, 10-13, and 19 to 9,750 in WMD 23.

The WMDs receiving the most ADPs per square mile of huntable habitat were:

- WMD 24 29 permits/mi²
- WMD 22 22 permits/mi²
- WMD 21 17 permits/mi²
- WMD 23 13 permits/mi²
- WMD 25 11 permits/mi²



Hunter Profiles

2018

Number of people who applied for ADPs:

Total	85,601
Residents.....	80,057
Nonresidents	5,544
Landowners	9,952
Superpack Permittees	2,605
Junior Hunters.....	7,574

2019

Number of people who applied for ADPs:

Total	77,214
Residents.....	72,187
Nonresidents	5,027
Landowners	8,985
Superpack Permittees	2,775
Junior Hunters.....	7,320

DEER MANAGEMENT SUBUNITS

In 2019, as part of an effort to mitigate some of the impacts associated with locally overabundant deer, MDIFW began issuing bonus antlerless deer permits in parts of some WMDs, referred to as deer management subunits. Bonus permits allow hunters to harvest one additional antlerless deer (i.e. a hunter may harvest a buck on their regular hunting permit and an antlerless deer on their bonus permit).

These deer management subunits consist of groups of towns experiencing high levels of deer-human conflict, such as deer-vehicle collisions, nuisance deer reports, and cases of Lyme disease. Subunits are impermanent but are intended to persist for at least five years, at which point MDIFW will reevaluate whether a subunit designation is still appropriate for the area. MDIFW created two deer

management subunits for the 2019 deer hunting seasons: Subunit 25a, consisting of the towns of Georgetown and Arrowsic in WMD 25, and Subunit 26a, consisting of portions of the towns of Brewer, Bucksport, Castine, Dedham, Holden, Orland, Orrington, Penobscot, and Verona in WMD 26. We will evaluate the need for additional subunits each year.

OVERALL HARVEST

Maine’s deer hunters registered 32,451 deer during the 2018 hunting seasons and 28,323 during the 2019 hunting seasons (Tables 1, 2). Overall, 5,218 more deer were harvested in 2018 than in 2017, representing a 19% increase. The trend reversed in 2019, with a 4,128-deer difference representing a 12% decrease. Approximately 84% of the 2018 and 85% of the 2019 deer harvest occurred during the four-week firearms season.



TABLE 1. STATEWIDE SEX AND AGE COMPOSITION OF THE 2018 DEER HARVEST IN MAINE BY SEASON AND WEEK.

SEASON	ADULT		FAWN		TOTAL DEER	TOTAL ANTLERLESS DEER	PERCENT BY SEASON AND WEEK		
	BUCK	DOE	BUCK	DOE			TOTAL	ADULT BUCK	ANTLERLESS
ARCHERY	853	921	191	203	2,168	1,315	7	5	9
Expanded	508	655	139	153	1,455	947	5	3	7
Oct	345	266	52	50	713	368	2	2	2
YOUTH DAY	345	436	125	124	1,030	685	3	2	5
REGULAR FIREARMS	15,858	7,716	1,999	1,672	27,245	11,387	84	87	80
Opening Sat	1,318	728	191	168	2,405	1,087	7	7	8
Oct 29 - Nov 3	2,598	1,504	366	312	4,780	2,182	15	15	15
Nov 5 - 10	2,882	1,275	371	290	4,818	1,936	15	16	14
Nov 12 - 17	4,017	1,696	448	361	6,522	2,505	20	22	17
Nov 19 - 24	5,043	2,513	623	541	8,720	3,677	27	27	26
MUZZLELOADER	1,134	614	127	128	2,003	869	6	6	6
Nov 26 - Dec 1	591	233	58	46	928	337	3	3	2
Dec 3 - 8	543	381	69	82	1,075	532	3	3	4
UNKNOWN	3	0	2	0	5	2	-	-	-
TOTAL	18,193	9,687	2,444	2,127	32,451	14,258	100	100	100

Corrections applied for errors in sex-age. Estimated error rates are applied independently for each table, so estimates will vary. 5 records with no season recorded.



Maine’s deer hunters registered 32,451 deer during the 2018 hunting seasons and 28,323 during the 2019 hunting seasons.



TABLE 1.1 STATEWIDE SEX AND AGE COMPOSITION OF THE 2019 DEER HARVEST IN MAINE BY SEASON AND WEEK.

SEASON	ADULT		FAWN		TOTAL DEER	TOTAL ANTLERLESS DEER	PERCENT BY SEASON AND WEEK		
	BUCK	DOE	BUCK	DOE			TOTAL	ADULT BUCK	ANTLERLESS
ARCHERY	979	915	116	170	2,180	1,201	7	5	14
Expanded	626	714	92	143	1,575	949	5	3	11
Oct	353	201	24	27	605	252	2	2	3
YOUTH DAY	419	285	51	45	800	381	3	2	5
REGULAR FIREARMS	17,958	4,653	832	741	24,184	6,226	86	90	75
Opening Sat	2,914	669	134	108	3,825	911	14	14	11
Nov 4 - 9	5,331	1,196	230	183	6,940	1,609	24	27	19
Nov 11 - 16	4,310	1,003	188	169	5,670	1,360	20	22	16
Nov 18 - 23	2,860	742	122	110	3,834	974	14	14	12
Nov 25 - 30	2,543	1,043	158	171	3,915	1,372	14	13	17
MUZZLELOADER	680	373	50	56	1,159	479	4	3	6
Dec 2 - 7	455	190	28	28	701	246	2	2	3
Dec 9 - 14	225	183	22	28	458	233	2	1	3
TOTAL	20,036	6,226	1,049	1,012	28,323	8,287	100	100	100

Corrections applied for errors in sex-age. Estimated error rates are applied independently for each table, so estimates will vary. 5 records with no season recorded.



♀ 2018

TABLE 2. SEX AND AGE COMPOSITION AND HARVEST TOTALS FOR THE 2018 DEER HARVEST IN MAINE BY WILDLIFE MANAGEMENT DISTRICT.

WMD	ADULT		FAWN		TOTAL		HARVEST PER 100 ADULT BUCKS		HARVEST PER 100 SQ MILES HABITAT		
	BUCK	DOE	BUCK	DOE	ANTLERLESS DEER	ALL DEER	DOES	ANTLERLESS	ADULT BUCKS	ALL	ADULT DOES
1	111	1	0	0	1	112	1	1	8	8	0
2	87	10	4	2	16	103	11	18	8	9	1
3	78	9	8	4	21	99	12	27	9	11	1
4	113	1	0	0	1	114	1	1	6	6	0
5	106	0	0	0	0	106	0	0	7	7	0
6	249	52	15	10	77	326	21	31	17	23	4
7	432	75	20	13	108	540	17	25	31	39	5
8	321	61	15	12	88	409	19	27	16	21	3
9	101	13	4	2	19	120	13	19	11	13	1
10	133	0	0	0	0	133	0	0	14	14	0
11	336	4	1	0	5	341	1	1	20	21	0
12	673	114	32	25	171	844	17	25	73	92	12
13	561	137	37	28	202	763	24	36	100	135	24
14	341	56	14	11	81	422	16	24	47	58	8
15	1,301	647	186	142	975	2,276	50	75	139	244	69
16	1,414	925	240	219	1,384	2,798	65	98	183	362	120
17	2,212	1,478	329	314	2,121	4,333	67	96	165	324	110
18	329	41	16	8	65	394	12	20	27	32	3
19	171	0	0	0	0	171	0	0	15	15	0
20	1,023	838	243	198	1,279	2,302	82	125	176	397	144
21	1,123	919	234	209	1,362	2,485	82	121	233	516	191
22	1,180	1,077	295	261	1,633	2,813	91	138	272	649	249
23	1,545	1,155	266	239	1,660	3,205	75	107	198	410	148
24	523	516	122	121	759	1,282	99	145	239	585	235
25	1,353	980	198	190	1,368	2,721	72	101	193	388	140
26	1,287	228	66	47	341	1,628	18	26	143	181	25
27	493	78	21	17	116	609	16	24	67	83	11
28	314	8	0	1	9	323	3	3	29	30	1
29	327	236	60	51	347	674	72	106	225	464	163
UNKNOWN	4		1			5					
STATEWIDE	18,241	9,659	2,427	2,124	14,209	32,451	53	78	63	113	34

Corrections applied for errors in sex-age. Estimated rates are applied independently for each table, so estimates will vary.
5 records with no WMD recorded.



2019

TABLE 2.1 SEX AND AGE COMPOSITION AND HARVEST TOTALS FOR THE 2019 DEER HARVEST IN MAINE BY WILDLIFE MANAGEMENT DISTRICT.

WMD	ADULT		FAWN		TOTAL		HARVEST PER 100 ADULT BUCKS		HARVEST PER 100 SQ MILES HABITAT		
	BUCK	DOE	BUCK	DOE	ANTLERLESS DEER	ALL DEER	ADULT DOES	ANTLERLESS	ADULT BUCKS	ALL	ADULT DOES
1	71	1	0	0	1	72	1	1	5	5	0
2	55	5	2	1	8	63	9	15	5	5	0
3	61	8	2	1	11	72	13	18	7	8	1
4	68	2	0	0	2	70	3	3	3	4	0
5	81	1	0	0	1	82	1	1	5	5	0
6	245	49	9	7	65	310	20	27	17	22	3
7	372	0	0	0	0	372	0	0	27	27	0
8	261	10	3	1	14	275	4	5	13	14	1
9	84	8	1	1	10	94	10	12	9	10	1
10	114	1	0	0	1	115	1	1	12	12	0
11	324	3	0	0	3	327	1	1	20	20	0
12	597	9	1	0	10	607	2	2	65	66	1
13	541	8	0	1	9	550	1	2	96	98	1
14	300	15	4	2	21	321	5	7	41	44	2
15	1,370	323	50	49	422	1,792	24	31	147	192	35
16	1,575	557	92	88	737	2,312	35	47	204	300	72
17	2,329	945	142	149	1,236	3,565	41	53	174	266	71
18	391	38	10	7	55	446	10	14	32	36	3
19	151	0	0	0	0	151	0	0	13	13	0
20	1,283	469	75	75	619	1,902	37	48	221	328	81
21	1,252	472	80	76	628	1,880	38	50	260	391	98
22	1,354	719	144	134	997	2,351	53	74	313	543	166
23	1,914	748	105	125	978	2,892	39	51	245	370	96
24	669	517	86	92	695	1,364	77	104	305	622	236
25	1,815	673	109	103	885	2,700	37	49	259	385	96
26	1,463	261	40	40	341	1,804	18	23	163	200	29
27	604	81	15	10	106	710	13	18	82	97	11
28	385	24	6	3	33	418	6	9	36	39	2
29	364	253	43	46	342	706	70	94	251	486	174
STATEWIDE	20,093	6,200	1,019	1,011	8,230	28,323	31	41	70	98	22

Corrections applied for errors in sex-age. Estimated rates are applied independently for each table, so estimates will vary.
5 records with no WMD recorded.



BUCK HARVEST

The statewide antlered (adult) buck harvest totaled 18,241 in 2018, a 0.2% decrease from the 2017 hunting season. In 2019, that number increased by 10.1% to 20,093 (Table 2.1). In 2018 and 2019, excluding WMD 29, the three WMDs producing the most bucks per square mile were (in descending order) districts 22, 24, and 21. In 2018, the 4th and 5th slots went to 23 and 25 respectively; and in 2019, it was reversed — 25 and 23.

ANTLERLESS HARVEST

Overall, 14,209 antlerless deer were registered by hunters in 2018 and 8,230 in 2019. In 2018, the statewide total harvest of adult (yearling and older) does was 9,659, which was above the Department's doe harvest objective of 8,759. This was the first time in over a decade that we met or exceeded our statewide doe harvest objective. Adult doe harvests have been on average ~19.5% below objective over the last decade, and the 2019 statewide harvest of adult does, at 6,200, was more on par with that pattern, falling short of the Department's doe harvest objective of 7,966.

The additional antlerless harvest was composed of 2,427 male and 2,124 female fawns in 2018 and 1,019 male and 1,011 female fawns in 2019.

YOUTH HARVEST

Youth day 2018 took place on Saturday, October 20, resulting in the harvest of 345 adult bucks and 685 antlerless deer (an overall 16% better harvest than 2017). Youth day 2019 took place on Saturday, October 26, resulting in the harvest of 419 adult bucks and 381 antlerless deer (22% less in total than in 2018).

HARVEST BY MAINE RESIDENTS

Maine residents harvested 30,319 deer in 2018 and 26,328 in 2019, representing 93% of the total deer harvest both years (Tables 3-5). Percentage of resident kills by season were: Youth Day (97.8% in 2018 and 98.3% in 2019), Archery (97.1% in 2018 and 96.8% in 2019), Muzzleloader (95.9% in 2018 and 95.3% in 2019), and Firearms (92.8% in 2018 and 92.3% in 2019, Table 3). During both years, the areas producing the most nonresident deer kills were along the western Maine-Canada border (Tables 4 and 5).

**TABLE 3. 2018 MAINE DEER HARVEST BY SEASON AND RESIDENCY.**

SEASON AND WEEK	RESIDENTS	NONRESIDENTS	UNKNOWN	TOTAL	PERCENT BY RESIDENTS
ARCHERY	2,104	62	0	2,166	97.1%
Expanded	1,418	32	0	1,450	97.8%
Oct	686	30	0	716	95.8%
YOUTH DAY	997	22	0	1,019	97.8%
REGULAR FIREARMS	25,294	1,962	2	27,258	92.8%
Opening Sat	2,412	8	0	2,420	99.7%
Oct 29 - Nov 3	4,476	300	0	4,776	93.7%
Nov 5 - 10	4,397	416	0	4,813	91.4%
Nov 12 - 17	5,816	707	0	6,523	89.2%
Nov 19 - 24	8,193	531	2	8,726	93.9%
MUZZLELOADER	1,922	81	0	2,003	95.9%
Nov 26 - Dec 1	871	57	0	928	93.9%
Dec 3 - 8	1,051	24	0	1,075	97.8%
UNKNOWN	2	3	0	5	-
TOTAL	30,319	2,130	2	32,451	93.4%


 2019

TABLE 3.1 2019 MAINE DEER HARVEST BY SEASON AND RESIDENCY.

SEASON AND WEEK	RESIDENTS	NONRESIDENTS	UNKNOWN	TOTAL	PERCENT BY RESIDENTS
ARCHERY	2,110	69	1	2,180	96.8%
Expanded	1,533	41	1	1,575	97.3%
Oct	577	28	0	605	95.4%
YOUTH DAY	786	14	0	800	98.3%
REGULAR FIREARMS	22,327	1,852	5	24,184	92.3%
Opening Sat	3,807	17	1	3,825	99.5%
Nov 4 - 9	6,329	610	1	6,940	91.2%
Nov 11 - 16	5,137	532	1	5,670	90.6%
Nov 18 - 23	3,435	397	2	3,834	89.6%
Nov 25 - 30	3,619	296	0	3,915	92.4%
MUZZLELOADER	1,105	54	0	1,159	95.3%
Dec 2 - 7	658	43	0	701	93.9%
Dec 9 - 14	447	11	0	458	97.6%
TOTAL	26,328	1,989	6	28,323	93.0%



2018

TABLE 4. 2018 MAINE DEER HARVEST BY COUNTY AND RESIDENCY.

COUNTY OF KILL	RESIDENTS	NONRESIDENTS	UNKNOWN	TOTAL	PERCENT BY RESIDENTS
ANDROSCOGGIN	2,077	32	0	2,109	98.5%
AROOSTOOK	796	127	0	923	86.2%
CUMBERLAND	2,566	78	1	2,645	97.0%
FRANKLIN	1,236	142	0	1,378	89.7%
HANCOCK	1,219	49	0	1,268	96.1%
KENNEBEC	3,399	106	0	3,505	97.0%
KNOX	1,458	59	0	1,517	96.1%
LINCOLN	1,170	24	0	1,194	98.0%
OXFORD	2,021	319	0	2,340	86.4%
PENOBSCOT	3,213	223	1	3,437	93.5%
PISCATAQUIS	987	207	0	1,194	82.7%
SAGADAHOC	1,285	20	0	1,305	98.5%
SOMERSET	2,794	381	0	3,175	88.0%
WALDO	1,968	130	0	2,098	93.8%
WASHINGTON	886	48	0	934	94.9%
YORK	3,241	182	0	3,423	94.7%
UNKNOWN	3	3	0	6	-
TOTAL	30,319	2,130	2	32,451	93.4%



2019

TABLE 4.1 2019 MAINE DEER HARVEST BY COUNTY AND RESIDENCY.

COUNTY OF KILL	RESIDENTS	NONRESIDENTS	UNKNOWN	TOTAL	PERCENT BY RESIDENTS
ANDROSCOGGIN	1,607	36	0	1,643	97.8%
AROOSTOOK	678	109	1	788	86.0%
CUMBERLAND	2,223	65	2	2,290	97.1%
FRANKLIN	893	128	0	1,021	87.5%
HANCOCK	1,400	66	0	1,466	95.5%
KENNEBEC	2,879	101	0	2,980	96.6%
KNOX	1,397	65	1	1,463	95.5%
LINCOLN	1,129	33	0	1,162	97.2%
OXFORD	1,522	250	1	1,773	85.8%
PENOBSCOT	2,847	220	0	3,067	92.8%
PISCATAQUIS	739	166	0	905	81.7%
SAGADAHOC	1,118	27	0	1,145	97.6%
SOMERSET	2,183	323	0	2,506	87.1%
WALDO	1,927	182	0	2,109	91.4%
WASHINGTON	1,024	58	0	1,082	94.6%
YORK	2,762	160	1	2,923	94.5%
TOTAL	26,328	1,989	6	28,323	93.0%



2018

TABLE 5. 2018 MAINE DEER HARVEST BY WILDLIFE MANAGEMENT DISTRICT AND RESIDENCY.

WMD	RESIDENTS		NONRESIDENTS		UNKNOWN	TOTAL
	NUMBER	PERCENT	NUMBER	PERCENT		
1	76	67.9%	36	32.1%	0	112
2	83	80.6%	20	19.4%	0	103
3	95	96.0%	4	4.0%	0	99
4	68	59.6%	46	40.4%	0	114
5	71	67.0%	35	33.0%	0	106
6	314	96.3%	12	3.7%	0	326
7	342	63.3%	198	36.7%	0	540
8	266	65.0%	143	35.0%	0	409
9	89	74.2%	31	25.8%	0	120
10	111	83.5%	22	16.5%	0	133
11	282	82.7%	59	17.3%	0	341
12	755	89.5%	89	10.5%	0	844
13	701	91.9%	62	8.1%	0	763
14	349	82.7%	73	17.3%	0	422
15	2,098	92.2%	177	7.8%	1	2,276
16	2,706	96.7%	92	3.3%	0	2,798
17	3,976	91.8%	357	8.2%	0	4,333
18	370	93.9%	24	6.1%	0	394
19	145	84.8%	26	15.2%	0	171
20	2,159	93.8%	143	6.2%	0	2,302
21	2,439	98.1%	46	1.9%	0	2,485
22	2,772	98.5%	41	1.5%	0	2,813
23	3,030	94.5%	175	5.5%	0	3,205
24	1,251	97.6%	31	2.4%	0	1,282
25	2,636	96.9%	85	3.1%	0	2,721
26	1,590	97.7%	37	2.3%	1	1,628
27	594	97.5%	15	2.5%	0	609
28	309	95.7%	14	4.3%	0	323
29	640	95.0%	34	5.0%	0	674
UNKNOWN	2	-	3	-	0	5
TOTAL	30,319	93.4%	2,130	6.6%	2	32,451



2019

TABLE 5.1 2019 MAINE DEER HARVEST BY WILDLIFE MANAGEMENT DISTRICT AND RESIDENCY.

WMD	RESIDENTS		NONRESIDENTS		UNKNOWN	TOTAL
	NUMBER	PERCENT	NUMBER	PERCENT		
1	51	70.8%	21	29.2%		72
2	54	85.7%	9	14.3%		63
3	72	100.0%		0.0%		72
4	38	54.3%	32	45.7%		70
5	49	59.8%	33	40.2%		82
6	288	92.9%	22	7.1%		310
7	230	61.8%	142	38.2%		372
8	163	59.3%	112	40.7%		275
9	70	74.5%	24	25.5%		94
10	97	84.3%	18	15.7%		115
11	266	81.3%	60	18.3%	1	327
12	549	90.4%	58	9.6%		607
13	474	86.2%	76	13.8%		550
14	260	81.0%	61	19.0%		321
15	1,619	90.3%	172	9.6%	1	1,792
16	2,210	95.6%	102	4.4%		2,312
17	3,261	91.5%	304	8.5%		3,565
18	406	91.0%	40	9.0%		446
19	134	88.7%	17	11.3%		151
20	1,783	93.7%	118	6.2%	1	1,902
21	1,852	98.5%	26	1.4%	2	1,880
22	2,305	98.0%	46	2.0%		2,351
23	2,669	92.3%	223	7.7%		2,892
24	1,332	97.7%	32	2.3%		1,364
25	2,594	96.1%	105	3.9%	1	2,700
26	1,744	96.7%	60	3.3%		1,804
27	688	96.9%	22	3.1%		710
28	400	95.7%	18	4.3%		418
29	670	94.9%	36	5.1%		706
TOTAL	26,328	93.0%	1,989	7.0%	2	28,323

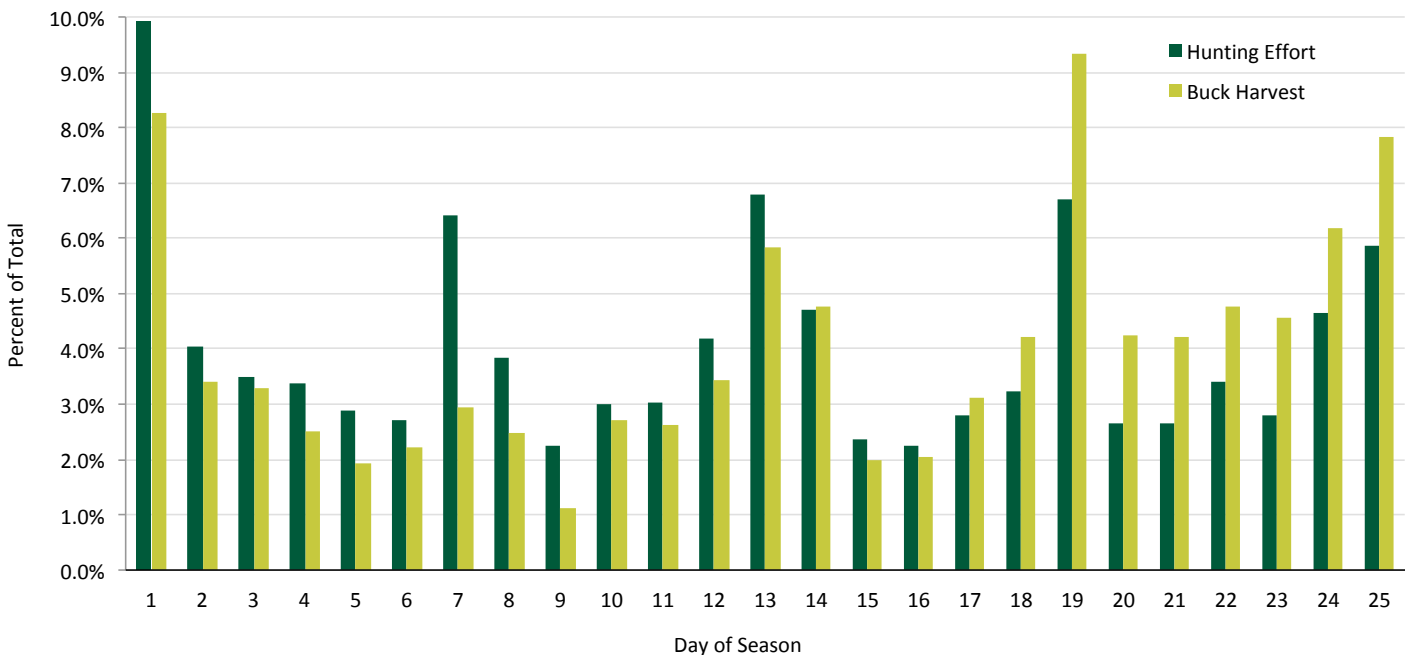


HUNTER PARTICIPATION

In 2018, there were 208,692 hunters in possession of an appropriate license to hunt deer. This was a 0.6% decline from 2017. Roughly 12% of these licenses belonged to nonresident or alien hunters. An estimated 168,000 hunters hunted deer statewide in 2018, which means hunter density statewide was ~5.8 hunters per square mile of deer habitat. Note that not all hunters that purchase a license or otherwise possess a license choose to hunt. During the 2018 regular firearms season for deer, Maine deer hunters spent an average of 8.4 days and 4.3 hours per day pursuing deer. This means that the average hunter spent ~36 hours in the field pursuing deer during the firearms season. Distribution of effort was slightly unusual in 2018, likely owing to heavy precipitation events on several Saturdays early in the season (Figure 1). Relative to the amount of effort invested, harvest was lower than usual for the first few Saturdays. Ideal conditions later in the season led to an increase in harvest relative to effort during the last week and a half of the season.

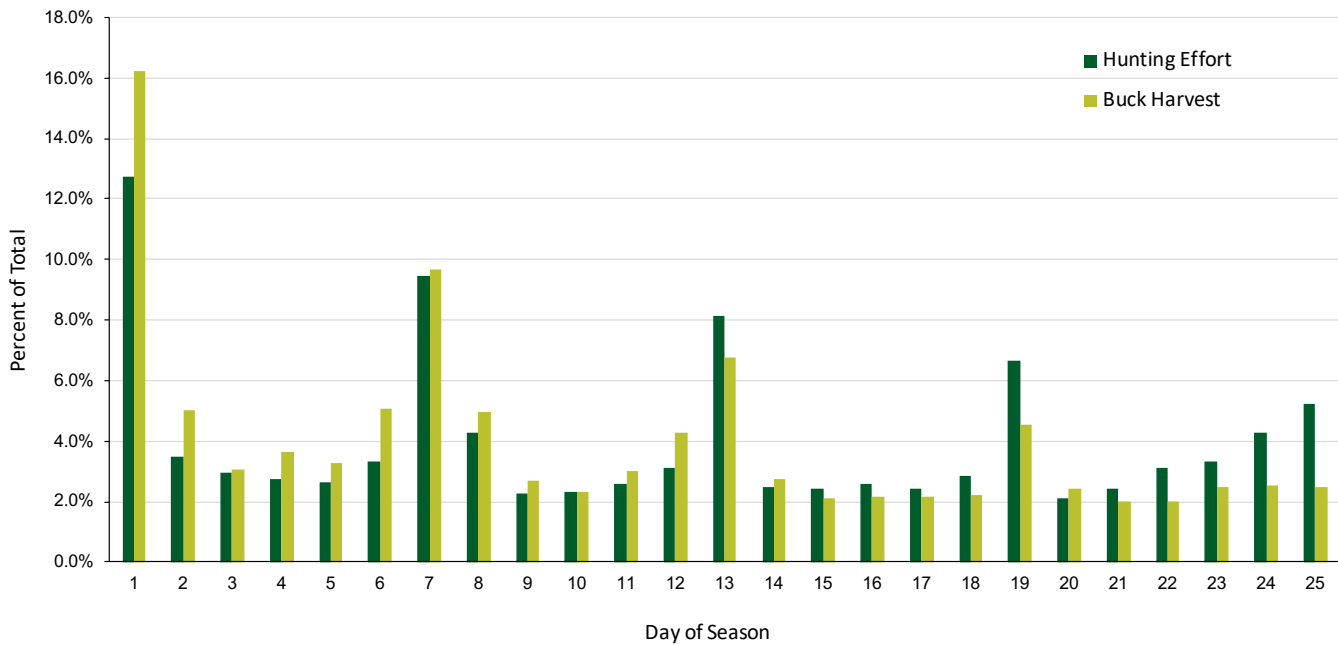
During the regular firearms season for deer, Maine deer hunters spent an average of 6.9 days and 4.9 hours per day pursuing deer. This means that the average hunter spent ~34 hours in the field pursuing deer during the firearms season. Distribution of effort followed a typical pattern with high hunting effort resulting in high buck harvest (Figure 1.1). Of note, however, the buck harvest relative to effort invested was higher than usual on Residents' Day with just under 13% of hunting effort resulting in over 16% of the total buck harvest during the firearms season. Buck harvest relative to effort invested was also a bit lower than usual over the Thanksgiving weekend. We typically see increased harvest over this holiday, but that was not the case in 2019.

2018 **FIGURE 1. PERCENTAGE OF HUNTING EFFORT (HOURS) AND BUCK HARVEST BY DAY DURING MAINE'S 2018 REGULAR FIREARMS SEASON FOR DEER. DAYS 1, 7, 13, 19, AND 25 WERE SATURDAYS.**





2019 **FIGURE 1.1 PERCENTAGE OF HUNTING EFFORT (HOURS) AND BUCK HARVEST BY DAY DURING MAINE'S 2019 REGULAR FIREARMS SEASON FOR DEER. DAYS 1, 7, 13, 19, AND 25 WERE SATURDAYS.**



BIOLOGICAL DATA

MDIFW sampled more than 8,146 white-tailed deer during the 2018 hunting season and 6,693 during the 2019 season to assess the status and health of the state’s deer populations. Some of the characteristics we monitored included yearling antler beam diameters (YABD), yearling frequencies in the harvest, age structure, estimated sex ratios, and mortality rates.

The antler diameter of yearling bucks in a WMD can help us identify when white-tailed deer have become overly abundant in that district. When there are too many deer in an area, the amount of forage available decreases, limiting availability of preferred foods and preventing deer from achieving optimum nutrition and peak antler growth. An average antler beam diameter between 15.5 to 16.8 mm indicates that a deer population is likely in balance with the availability of forage. If measurements are larger, there is enough forage available for the population to grow. If the measurements are smaller, the animals have become too abundant in the WMD and have reduced the availability of quality forage.

In 2018, Maine’s yearling bucks expressed overall good health with a statewide average beam diameter of 17.7 mm and WMD averages between 16.1 mm to 18.8 mm. The same was true in 2019, with yearling bucks showing a statewide average beam diameter of 16.3 mm and YABD ranging between 15.7 and 18.4 in WMDs with at least 20 samples.

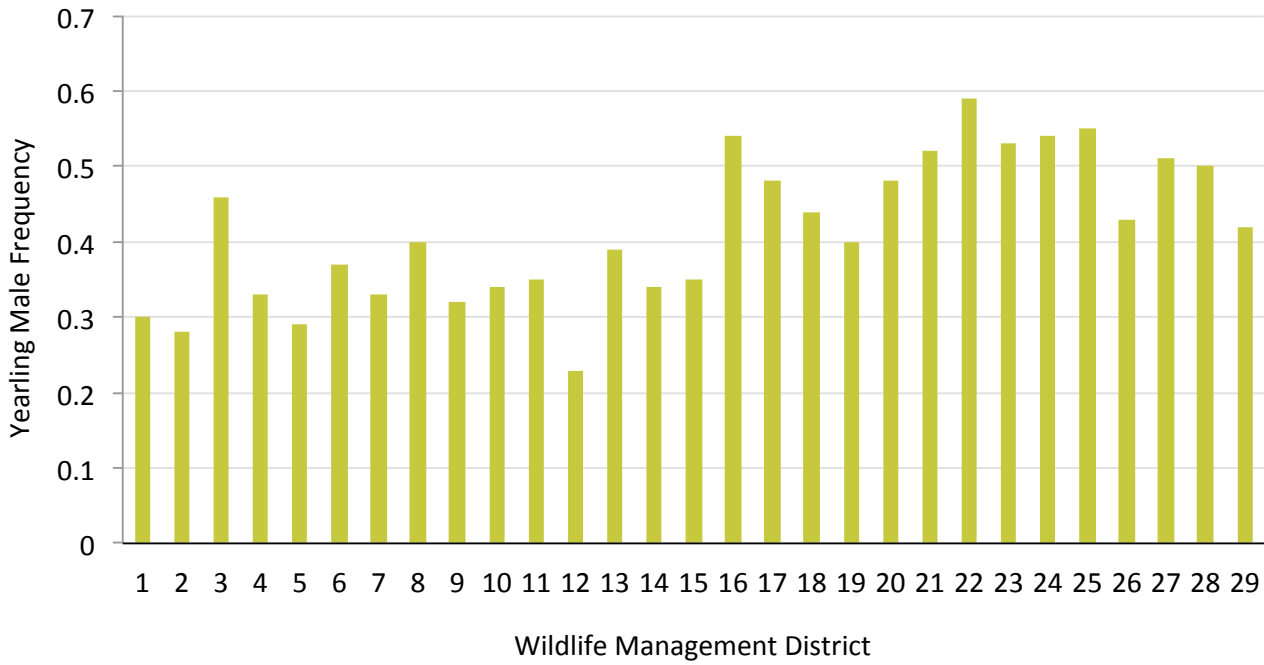
Research has shown that the percentage of yearling bucks within the adult buck harvest can be used as an estimate of all-cause annual mortality for male white-tailed deer. Statewide in 2018, 40% of the male harvest was made up of yearling bucks (Figure 2). Statewide in 2019, 36% of the male harvest was comprised of yearling bucks with yearling buck percent ranging from 25% in WMD 12 to 58% in WMD 22 (Figure 2.1). Because data are often limited, particularly in northern WMDs, pooled data may be used. Increased confidence in yearling frequencies and advanced age structure data is obtained by extracting incisor teeth from a sub-sample of deer throughout the state. Most of these teeth are analyzed to determine precise age in a laboratory, and these results typically take ~6 months to produce.

MDIFW monitors sex ratios (doe:buck) in all Maine WMDs. A sex ratio skewed towards does can be preferable in areas of desired population growth, but breeding success may begin to decline if the doe:buck ratio exceeds ~4:1. In 2018, Maine’s WMDs averaged 1.9 adult does per adult buck and ranged from 1.1 to 3.1 (Figure 3). In 2019, estimated sex ratios in Maine’s WMDs ranged from 1.0 to 3.0 (Figure 3.1). Weighted by proportion of harvest in each WMD, Maine’s statewide adult doe:adult buck ratio was ~2.3 to 1 in 2018 and ~2.2 to 1 in 2019.



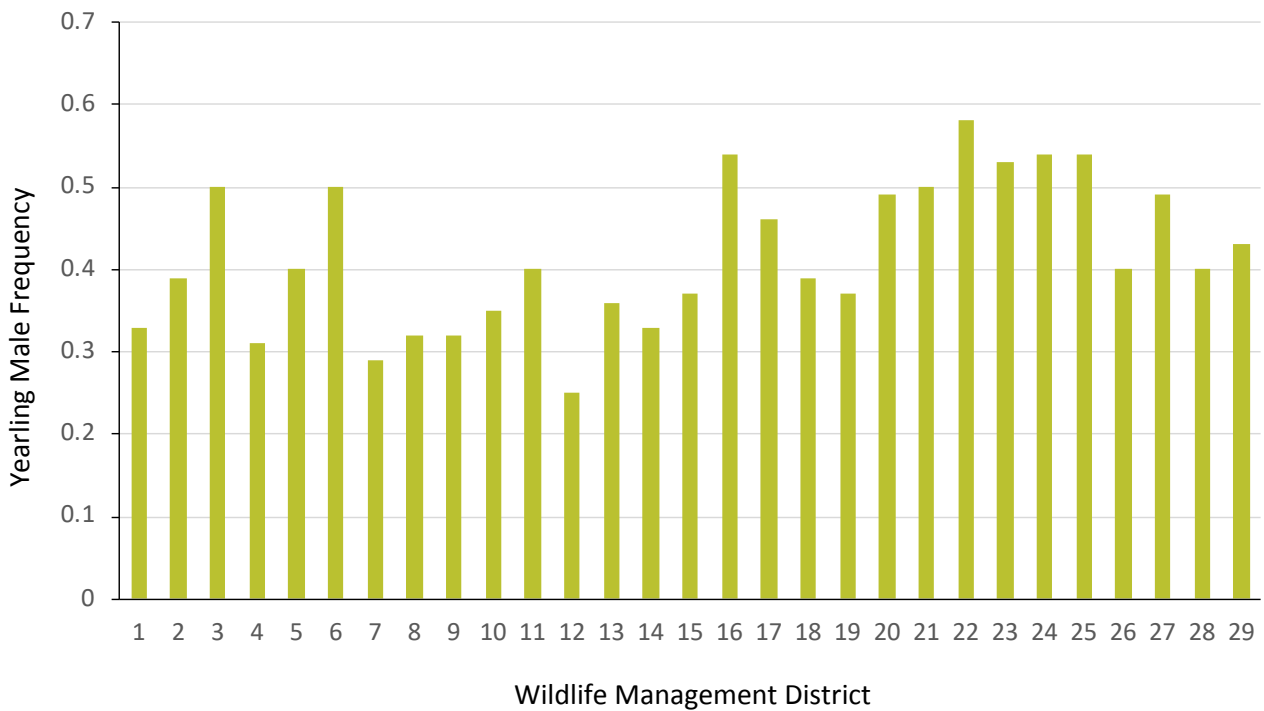
♂ 2018

FIGURE 2. YEARLING MALE FREQUENCY IN THE 2018 DEER HARVEST IN MAINE.



♂ 2019

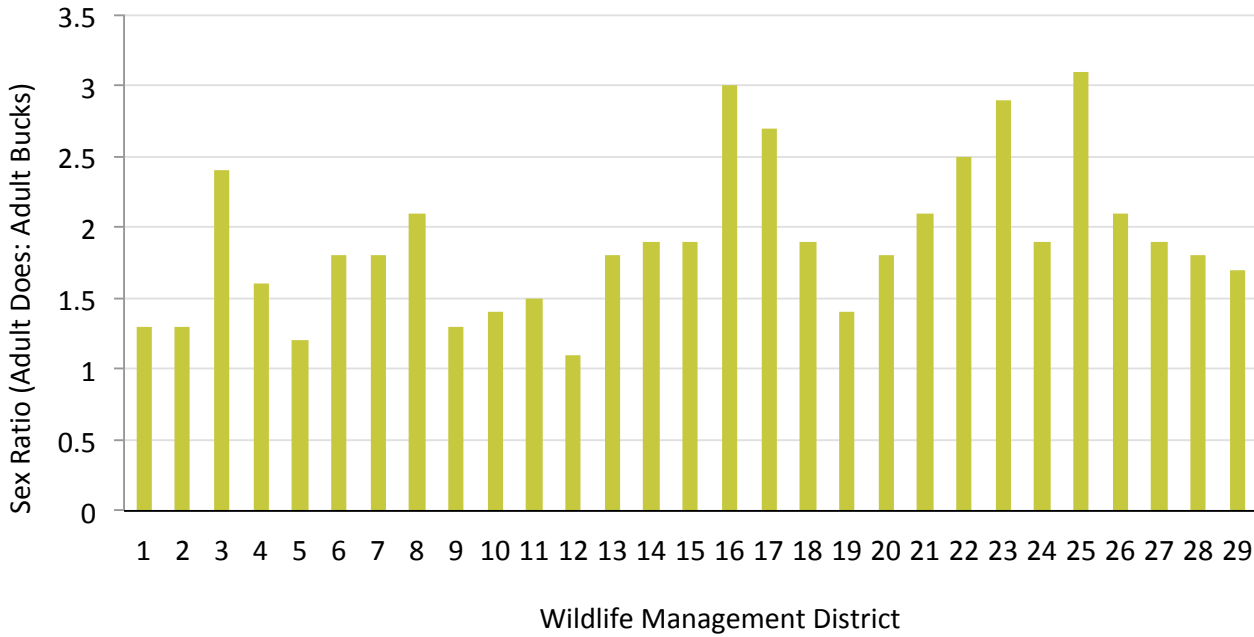
FIGURE 2.1. YEARLING MALE FREQUENCY IN THE 2019 DEER HARVEST IN MAINE.





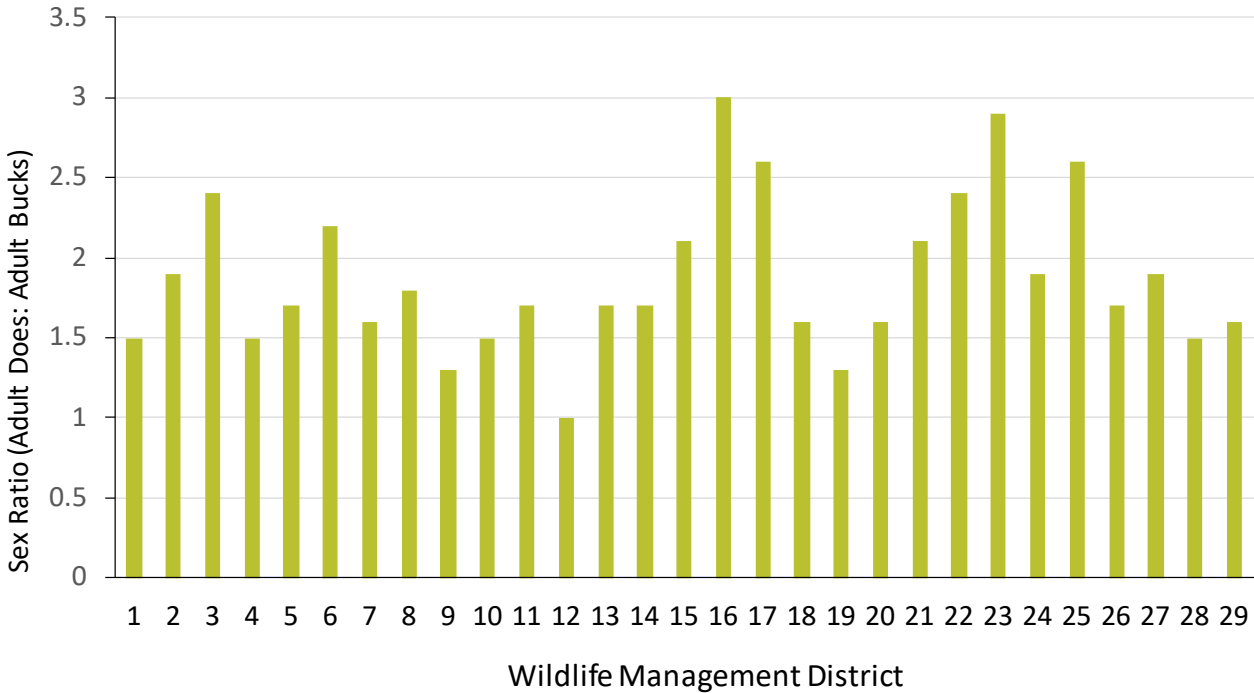
2018

FIGURE 3. ESTIMATED SEX RATIO OF DEER IN MAINE'S WILDLIFE MANAGEMENT DISTRICTS IN 2018.



2019

FIGURE 3.1 ESTIMATED SEX RATIO OF DEER IN MAINE'S WILDLIFE MANAGEMENT DISTRICTS IN 2019.

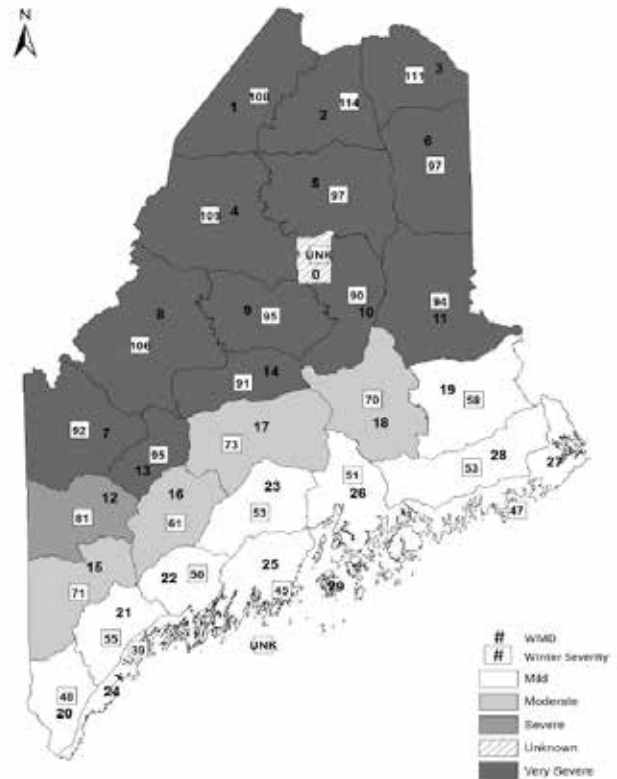


WINTER SEVERITY

Each year, MDIFW monitors temperature, snow depth, and deer sinking depth at monitoring stations around the state. This information is used to calculate a winter severity index (WSI) for each WMD in the state. Past MDIFW research has related WSI to observed winter mortality rates (WMR) in deer by conducting dead deer surveys in deer wintering areas, and this relationship between WSI and WMR is one consideration made each year when issuing ADP.

The statewide WSI for 2018-2019 was 77, which ranks in our severe winter category (Mild <60, Moderate 60-74, Severe 75-89, Very Severe 90+). Variation between WMDs was very high this winter with our highest WSI value being recorded in WMD 2 where WSI was 114 and our lowest value recorded in WMD 24 where WSI was 39. WSI was in the very severe category in the northern half of the state and moderated south through Maine where much of southern and coastal Maine experienced mild winter conditions.

FIGURE 4. WINTER SEVERITY INDEX (WSI) VALUES FOR MAINE WMDs THROUGH THE 2018-2019 WINTER.





Deer Winter Mortality Study

Background

Since 2015, MDIFW has been capturing and GPS-collaring white-tailed deer to monitor survival rates and impacts of winter severity, movements, and causes of mortality. The study has grown over the years and now includes four study sites: WMD 1 near Allagash, WMD 5 near the Scraggly Lake Maine Public Reserved Land, WMD 6 throughout, and WMD 17 throughout. Achieving a better understanding of how environmental factors influence deer survival through winter will aid MDIFW in decision making and permit allocation processes each year.

Progress

To date, 204 unique deer have been collared: 42 in WMD 1, 10 in WMD 5, 83 in WMD 6, and 69 in WMD 17. The 2019-2020 season was the sixth year for the project.

During the past two seasons, efforts have been focused in WMDs 1, 5, and 6. 2018-2019 marked the first season of capture in WMD 5, where crews spent ~1 month exploring the study site, assessing its suitability for capture, and conducting preliminary capture efforts. The WMD 5 site was added to bolster the number of study animals that do not receive any sort of supplemental feed during the winter (deer in our WMD 6 and 17 study sites have access to supplemental feed in winter, typically from wildlife feeders or crop spillage).

In 2019-2020, we spent one week in December in WMD 6 and deployed 13 collars there with a small team. After the remainder of the team arrived to work for the season, we focused our efforts on WMDs 1 and 5, continuing trapping activities through late March. We collared 20 new deer in WMD 1 and 20 in WMD 5 as well.

Capture efforts will likely conclude next year when we wrap up work in WMD 5. It has proven difficult to achieve desired sample sizes in WMDs 1 and 5, so capture efforts will focus on these study sites for the remainder of the study.

Disease Monitoring in Maine's Deer and Moose

Chronic Wasting Disease

BACKGROUND

Chronic wasting disease (CWD) is a fatal brain disease that impacts white-tailed deer, mule deer, caribou, moose, and

elk. It is similar to mad cow disease, which occurs in cattle, and it has a 100% mortality rate in deer.

CWD has been found in wild deer populations in 24 U.S. states and two Canadian provinces, but it has not yet been found in Maine. CWD can persist in the environment outside of a host for many years, and recent research has shown that plants can uptake the disease agent and subsequently become a potential disease vector.

There is currently no evidence that CWD can or has been transferred to humans, but similar diseases in humans do exist, and the disease has been transmitted to primates in a laboratory setting.

WHAT MDIFW IS DOING

MDIFW has monitored white-tailed deer for CWD since 1999, during which time we have screened over 11,000 wild deer. In 2019, we collected 524 samples for lab testing: 499 from white-tailed deer, 21 from moose, and 4 from miscellaneous cervids. As a precaution, MDIFW does not translocate deer from other states into Maine, and we prohibit the transportation of unprocessed deer carcasses and/or parts into Maine from all states and provinces other than New Hampshire. MDIFW is currently drafting a response plan for CWD, which will outline steps and protocols to follow if CWD is detected in an adjacent jurisdiction or in Maine.

WHAT YOU CAN DO

Prevent the spread: You can help prevent the spread of disease in the deer population by using multiple small feed sites if you feed deer, and by relocating these sites periodically. Also, refrain from using urine-based lures, and instead use an alternative such as synthetic urine.

Report the signs: Contact your regional wildlife biologist or warden if an animal shows clinical signs of illness, such as loss of fear of humans, drooling, and/or excessive weight loss.

Protect yourself: When processing a harvested deer, take precautionary steps such as using latex gloves and sterilizing your equipment afterward. Also, avoid consuming the brain and spinal tissues. Even though CWD has not yet been identified in humans, these steps reduce the risk of transmitting any cervid-borne disease

This work is supported by the federal Pittman-Robertson program, state revenues from the sales of hunting licenses, and volunteer assistance.



MOOSE

Lee Kantar

2018-2019 Moose Harvest

Season Dates and Structure

The 2018 and 2019 season frameworks allowed Maine moose hunters to hunt for six days either in September and October.





Season Dates

2018

WMDs 1-6

Sep 24-29

Oct 8-13

Oct 22-27

WMDs 15-16

Oct 27*-Nov 24

2019

WMDs 1-6

Sep 23-28

Oct 14-19

Oct 28-Nov 2

WMDs 15-16

Nov 2*-Nov 30

Statistics

2018

1,888
moose were
registered

2019

1,949
moose were
registered

Moose Permits and Applicants

TOTAL MOOSE PERMITS

The annual allocation of moose hunting permits is developed in response to the Big Game Management Plan (BGMP) for moose. Permit levels changed in 11 WMDs from 2017 to 2018, resulting in an increase of 420 permits issued statewide (2,500 total). From 2018 to 2019, they also changed in 11 WMDs, resulting in an increase of 320 permits issued statewide (2,820 total). Permit changes reflect the implementation of the BGMP which includes an increase in cow permits in the core range to promote a healthier moose population, additional WMDs open during the September season, and increased bull-hunting opportunity in the northwest portion of the core range.

Moose hunting permits are allocated to qualified applicants in a random computerized lottery, and additional permits may be issued to prior-year permittees who deferred a year due to illness, armed service, or similar situations

ANTLERLESS-ONLY PERMITS (AOPS)

In 2018, a total of 450 Antlerless-Only Permits (AOPs) were allotted to six WMDs (1-6). In 2019, a total of 650 AOPs were allocated to the same six WMDs.

Moose health is directly tied to the productivity of cows. A healthier moose population has heavier cows that reproduce at an earlier age, reproduce more frequently, and have a higher probability of calving twins. Over the last 30 years, productivity in Maine moose has declined. Moose populations that exist at lower densities tend to have higher rates of productivity.

ANY-MOOSE PERMITS (AMPS)

Any-moose Permits (AMPs; bull, cow or calf) are allocated to areas of southern Maine where moose densities are lower and allow for a small harvest. To honor southern Maine landowners' recommendations, this season coincides with the November firearms season for deer.



Statewide Statistics for 2018 and 2019

1,888 moose were registered in 2018 (Table 1) and 1,949 were registered in 2019 (Table 1.1).



2018

TABLE 1. 2018 MAINE MOOSE SEASON REGISTERED KILL BY WMD, SEASON, PERMIT TYPE, AND SUCCESS RATE.

WMD	SEASON	PERMIT TYPE	# OF PERMITS	2018 REGISTRATIONS		WMD	SEASON	PERMIT TYPE	# OF PERMITS	2018 REGISTRATIONS		
				KILL	SUCCESS RATE					KILL	SUCCESS RATE	
1	SEP	BOP	150	130	87%	10	SEP	BOP	30	21	70%	
	OCT	BOP	150	128	85%		OCT	BOP	30	17	57%	
	2nd OCT	AOP	100	86	86%		*WMD Subtotals		60	38	63%	
	*WMD Subtotals		400	344	86%		SEP	BOP	25	18	72%	
2	SEP	BOP	125	104	83%	11	OCT	BOP	25	22	88%	
	OCT	BOP	125	98	78%		*WMD Subtotals		50	40	80%	
	2nd OCT	AOP	100	80	80%		12	OCT	BOP	35	23	66%
	*WMD Subtotals		350	282	81%			*WMD Subtotals		35	23	66%
3	SEP	BOP	75	64	85%	13	OCT	BOP	35	11	31%	
	OCT	BOP	75	64	85%		*WMD Subtotals		35	11	31%	
	2nd OCT	AOP	75	65	87%		14	OCT	BOP	35	21	60%
	*WMD Subtotals		225	193	86%			WMD Subtotals		35	21	60%
4	SEP	BOP	150	116	77%	15	NOV	AMP-B		3	NA	
	OCT	BOP	100	71	71%		NOV	AMP-C		3	NA	
	2nd OCT	AOP	100	78	78%		WMD Subtotals		25	6	24%	
	*WMD Subtotals		350	265	76%		NOV	AMP-B		1	NA	
5	SEP	BOP	100	86	86%	16	NOV	AMP-C		0	NA	
	OCT	BOP	50	37	74%		WMD Subtotals		20	1	5%	
	2nd OCT	AOP	50	34	68%		17	OCT	BOP	20	6	30%
	*WMD Subtotals		200	157	79%			WMD Subtotals		20	6	30%
6	SEP	BOP	100	80	80%	18	SEP	BOP	20	12	60%	
	OCT	BOP	50	37	74%		OCT	BOP	20	12	60%	
	2nd OCT	AOP	25	19	76%		*WMD Subtotals		40	24	60%	
	*WMD Subtotals		175	136	78%		SEP	BOP	45	25	56%	
7	OCT	BOP	125	94	75%	19	OCT	BOP	30	12	40%	
	*WMD Subtotals		125	94	75%		*WMD Subtotals		75	37	49%	
8	OCT	BOP	175	140	80%	27/28	SEP	BOP	15	9	60%	
	*WMD Subtotals		175	140	80%		OCT	BOP	15	5	33%	
9	OCT	BOP	75	56	75%	WMD Subtotals		30	14	47%		
	WMD Subtotals		75	56	75%	OVERALL WMD TOTALS		2,500	1,888	76%		

BOP = Bull Only Permit – The holder may kill one male moose of any age.
 AOP = Antlerless Only Permit – The holder may kill a cow, a calf, or a bull w/antlers shorter than its ears.
 AMP = Any Moose Permit – The holder may kill any moose.
 *Does not include additions to total permit allocation through deferment, hunt of a lifetime, and auction.



2019

TABLE 1.1 2019 MAINE MOOSE SEASON REGISTERED KILL BY WMD, SEASON, PERMIT TYPE, AND SUCCESS RATE.

WMD	SEASON	PERMIT TYPE	# OF PERMITS	2019 REGISTRATIONS		WMD	SEASON	PERMIT TYPE	# OF PERMITS	2019 REGISTRATIONS	
				KILL	SUCCESS RATE					KILL	SUCCESS RATE
1	SEP	BOP	175	105	60%	10	SEP	BOP	30	22	73%
	OCT	BOP	175	125	71%		OCT	BOP	30	23	77%
	2nd OCT	AOP	125	95	76%		*WMD Subtotals		60	45	75%
	*WMD Subtotals		475	325	68%		SEP	BOP	25	11	44%
2	SEP	BOP	125	88	70%	11	OCT	BOP	25	21	84%
	OCT	BOP	125	101	81%		*WMD Subtotals		50	32	64%
	2nd OCT	AOP	125	95	76%		12	OCT	BOP	25	15
	*WMD Subtotals		375	284	76%	*WMD Subtotals		25	15	60%	
3	SEP	BOP	75	53	71%	13	OCT	BOP	15	8	53%
	OCT	BOP	75	66	88%		*WMD Subtotals		15	8	53%
	2nd OCT	AOP	100	69	69%		14	OCT	BOP	30	25
	*WMD Subtotals		250	188	75%	WMD Subtotals		30	25	83%	
4	SEP	BOP	150	92	61%	15	NOV	AMP-B		2	NA
	OCT	BOP	150	96	64%		NOV	AMP-C		3	NA
	2nd OCT	AOP	150	80	53%		WMD Subtotals		25	5	20%
	*WMD Subtotals		450	268	60%	16	NOV	AMP-B		2	NA
5	SEP	BOP	100	83	83%	17	NOV	AMP-C		2	NA
	OCT	BOP	100	78	78%		WMD Subtotals		15	4	27%
	2nd OCT	AOP	100	59	59%		OCT	BOP	10	7	70%
	*WMD Subtotals		300	220	73%	WMD Subtotals		10	7	70%	
6	SEP	BOP	100	67	67%	18	SEP	BOP	20	10	50%
	OCT	BOP	50	39	78%		OCT	BOP	20	10	50%
	2nd OCT	AOP	50	35	70%		*WMD Subtotals		40	20	50%
	*WMD Subtotals		200	141	71%	19	SEP	BOP	30	20	67%
7	OCT	BOP	125	93	74%	OCT	BOP	30	21	70%	
	*WMD Subtotals		125	93	74%	*WMD Subtotals		60	41	68%	
8	OCT	BOP	175	125	71%	27/28	SEP	BOP	20	9	45%
	*WMD Subtotals		175	125	71%		OCT	BOP	20	10	50%
9	OCT	BOP	100	83	83%		WMD Subtotals		40	19	48%
	WMD Subtotals		100	83	83%	OVERALL WMD TOTALS		2,820	1,948	69%	

1 Bull was registered with no data for total harvest = 1,949

BOP = Bull Only Permit – The holder may kill one male moose of any age.

AOP = Antlerless Only Permit – The holder may kill a cow, a calf, or a bull w/antlers shorter than its ears.

AMP = Any Moose Permit – The holder may kill any moose.

*Does not include additions to total permit allocation through deferment, hunt of a lifetime, and auction.

2018-2019 Bull Harvest

TOTAL HARVEST, AGE DISTRIBUTION

Among the 1,541 antlered bulls killed during the Sept/Oct 2018 season (a total of 203 more than the 2017 harvest of 1,338), biologists aged 1,377 of them by counting the cementum annuli on a tooth extracted from the animal.

Ages were distributed as follows:

- 1½ years old (yearlings sporting their first set of antlers): 12% (171)
- 2½ years old: 24% (328)
- 3½ years old: 13% (178)
- Mature bulls (aged at 4½ to 18½ years): 40% (700)

Among the 1,519 antlered bulls killed during the Sept/Oct 2019 season (a total of 22 less than the 2018 harvest of 1,541), biologists aged 1,308 of them by counting the cementum annuli on a tooth extracted from the animal.

Ages were distributed as follows:

- 1½ years old (yearlings sporting their first set of antlers): 6% (76)
- 2½ years old: 25% (330)
- 3½ years old: 19% (246)
- Mature bulls (aged at 4½ to 18½ years): 34% (655)

AVERAGE WEIGHT

On average, breeding bulls lose approximately 15% of their body mass during the rut (September to October). In 2018, this translated to an 8% decrease in average dressed weights from the September to October seasons (715 in Sept. vs. 657 in Oct.). In 2019, the decrease was 9% (714 in Sept. vs. 647 in Oct.).

RECORD WEIGHT

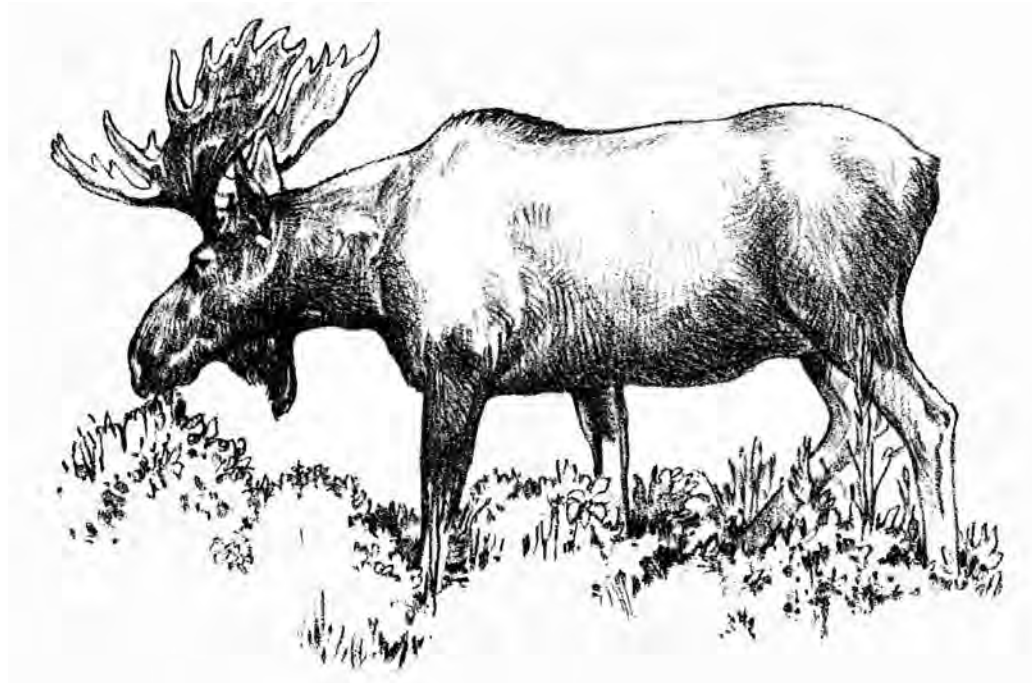
In 2018, the heaviest bull weighed in at 1,077 lbs. field dressed (no digestive tract, heart, lungs, or liver). He was 5½ years old and was killed in WMD 18 during the September season. In 2019, the heaviest bull was 1,011 lbs. field dressed. He was 9½ years old and was killed in WMD 3 during the September season.

RECORD ANTLER SPREAD

In 2018, the largest antler spread was 67 inches with 15 legal points. He was 8½ years old. In 2019, the largest antler spread was 67 inches with 24 legal points. He was 12½ years old.

ANTLER STATS

In 2018, 16% of the antlered bulls sported cervicorn antlers (antlers without a defined palm), 50% were yearlings, and 11% were mature bulls (>4 years old). The oldest was 11½ years old. In 2019, 23% of the antlered bulls had cervicorn antlers, 33% were yearlings, and 21% were mature bulls (>4 years old). The oldest was 12½ years old.





Antlerless Harvest

TOTAL HARVEST

In 2018, the statewide harvest of adult (yearling and older) cows was 343 (up from 149 in 2017). In addition, 24 calves (15 males and 9 females) were harvested for a total harvest of 367 antlerless moose, including those taken as part of the AMPs issued within the southern zones.

In 2019, the statewide harvest of adult (yearling and older) cows was 383 (just slightly higher than 2018). In addition, 47 calves (26 males and 21 females) were harvested for a total harvest of 430 antlerless moose, including those taken as part of the AMPs issued within the southern zones.

MOOSE REPRODUCTIVE DATA

Antlerless permits during the second October season allow MDIFW to collect reproductive data critical to assessing and monitoring moose population health and growth. In 2018, hunters in WMDs 1-6 removed and brought in 117 sets of moose ovaries for examination by biological staff. In 2019, they brought in 110.

Typically, a moose cow does not become pregnant until 2½ years old. At that point, her fertility and the number of offspring she will produce depend upon her body weight and condition – factors influenced strongly by diseases, parasites such as the winter tick, and the amount of available forage (food).

Of the cow moose examined in 2018 that were older than 2½ years, 83% were pregnant. In 2019, 95% were.

MDIFW biologists can forecast a cow's reproduction rates by looking at corpora lutea, which are identifiable structures within the ovaries that indicate ovulation and potential pregnancy rates. In 2018, there were 0.85 corpora lutea per cow for cows older than 3½ years – a significant decline from 2017 representing poor reproductive rates (number of calves being born to a cow). In 2019, the number increased significantly to 1.03 corpora lutea per cow for cows older than 2½ years, signaling improved reproductive rates.

We continue to evaluate the role of winter ticks and their impact on moose fitness, including their role in depressed reproductive rates.

Hunter Participation, Residency, & Success Rate

In 2018, 2,259 residents and 241 nonresidents won permits to hunt moose. In 2019, 2,565 residents and 278 nonresidents won permits. In both years, most nonresidents were successful in their hunt (86% success rate in 2018 and 92% in 2019). In 2018, out-of-state hunters came from 33 states (as far away as Guam), and in 2019 they came from 36 states as far away as Alaska and one Canadian Province. Both years, more out-of-state hunters came from Pennsylvania than any other state (20% in 2018 and 14% in 2019).

In 2018, resident success rates were 75%; and when combined with the outstanding success by out-of-staters, made the total success rate 76%. In 2019, the resident success rate was 66% and the total success rate was 69%. The higher success rates of out-of-state hunters, as compared to residents, may be attributed to the higher proportion of out-of-state hunters using registered Maine Guides for their hunt. Success rates over the last 10 years have been around 80%.

In 2018, conditions for September and October were seasonable and included measurable snow in some areas. In 2019, they were highly variable, with September starting out warm and wet. Unseasonable conditions typically lead to lower success rates.

In 2020, there will be four separate moose hunting periods in Maine.

- The September season will run from Sep 28 – Oct 3 in WMDs 1-6, 10,11,19, and 27/28.
- The October season will run from Oct 12-17 in WMDs 1-14, 17-19, and 27/28.
- In WMDs 15 and 16, the season will coincide with November's deer season, which runs from Nov 2 through Nov 28. Opening day for Mainers will be on Saturday, Oct 31.
- WMDs 1-6 will have a cow moose hunt from Oct 26 through Oct 31.

Lastly, moose hunters who have a permit to hunt WMD 27 or WMD 28 can hunt in either WMD.



Comprehensive Moose Management in Maine

In the winter of 2010-11, the Department began conducting aerial surveys to estimate moose abundance and composition (bull, cow, and calf) across Maine's core range of moose (roughly a line from Grafton Notch to Calais). This aerial survey data, combined with reproductive data from female moose (ovaries) and age data from moose teeth (removed at registration stations), is providing biologists with a more complete picture of Maine's moose population size and composition than ever before. Biologists and regulators, like the Commissioner's Advisory Council, use these data to align moose permit levels with publicly-derived management goals, which include moose viewing and hunting (both weighed equally).

Moose Adult Cow and Calf Survival Study

The size of Maine's moose population is not static, and it fluctuates in response to many factors, including calf birth and adult survival rates. In cooperation and collaboration with the University of New Hampshire, New Hampshire Fish and Game, and the University of Maine-Animal Health Lab, we're currently conducting a study that monitors calf and adult survival rates and closely examines mortality sources.

The study began in the winter of 2014 and was designed to continue for a minimum of five years. We launched the study in western Maine (WMD 8), and, in 2016, we added a second study area in northern Maine (WMD 2).

Since 2014, we have captured 600 moose and fitted them with GPS collars. These collars enable us to track moose locations and movements over time, and to be notified via text/email message if a moose dies.

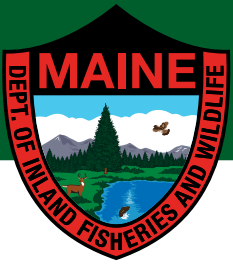
We observe adult cows each spring and summer to determine reproduction and survival of calves; for each collared moose, we collect detailed health information, including an assessment of blood parameters, parasite loads, body condition, and winter tick loads.

This information is providing our researchers with an unprecedented, in-depth look at moose health, including the impact of parasites on survival and reproduction. That winter, we fit another 70 calves with GPS collars as part of this ongoing research.

Adaptive Management Unit

This past winter, we fit an additional 60 calves in WMD 4 with GPS collars to compare calf survival with those in WMDs 2 and 8. This new unit will be monitored for the coming years to look at potential winter tick impacts in this remote section of Maine. The Department, with public input, is carefully considering dividing WMD 4 in two halves. One half would see an increase in moose permits to determine if reducing moose in a subunit can break the winter tick cycle and reduce calf mortality.

This work is supported by the federal Pittman-Robertson program, state revenues from the sales of hunting licenses, and volunteer assistance



BLACK BEAR

Jennifer Vashon and Randy Cross

The Maine black bear is an iconic symbol of Maine's forests and one of our wildlife success stories. Once relegated to no more than a nuisance, the black bear has risen in stature to one of our state's most valued animals.



Today, Maine’s expansive northern, eastern, and western forest supports one of the largest black bear populations in the lower-48 states (**Figure 1**). This population is valued by hunters and wildlife watchers alike. MDIFW strives to balance biological and social needs by basing management decisions on the bear monitoring, harvest, and conflict data we gather.

Monitoring

MDIFW’s black bear monitoring program is one of the most extensive and longest-running programs of its type in the U.S. For the last 45 years, Department biologists have captured and tracked over 3,000 bears to determine their health and condition, estimate how many cubs are born each year, and determine annual cause-specific mortality rates.

Population Management

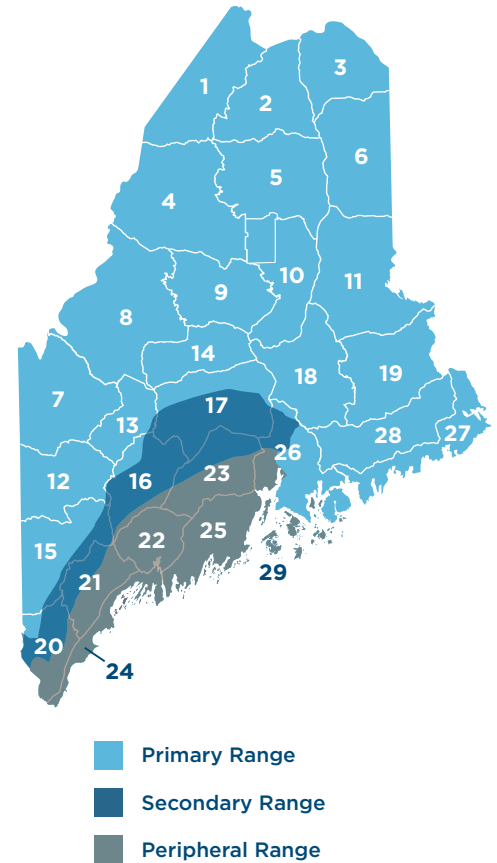
To maintain the bear population at a healthy and socially-acceptable level, the Department’s primary tool is hunting. Since 2005, Maine’s black bear population has steadily increased. The population grew from 23,000 in 2004 to ~36,000 in 2015, and annual harvest levels remain below what would be needed to stabilize it.

Maine offers a variety of traditional bear hunting methods, but the odds of taking a bear are low. Most (90%) bears are harvested with bait, trained bear dogs, or traps, but hunters also have the option of still-hunting or stalking, including the opportunity to take a bear while hunting deer. Success rates are just 26% for hunters using bait or trained bear dogs, <20% for trappers, and <3% for those who still-hunt or stalk bear through Maine’s dense forests.

Bear Management 2017-2027

MDIFW biologists set management goals through a strategic planning process which includes public input. In 2017, we finalized a new 10-year management plan for Maine’s big game species (deer, moose, bear, and turkey). This plan carefully considers black bears’ value to outdoor enthusiasts and the general public, as well as the likely public acceptance of an increasing bear population. In order to achieve the goal and objectives outline in the plan, there are a series of management strategies designed to ensure continued enjoyment of black bears without too many conflicts in backyards and neighborhoods.

FIGURE 1. MAINE BLACK BEAR RANGE





Living with Black Bears

Maine’s bear population is one of the largest in the country—thriving in the forests that cover more than 90% of our state’s land area.

Despite a large bear population, the number of conflicts between humans and black bears in Maine is lower than other northeastern states, averaging about 500 complaints each year. This relatively low conflict level is partially-attributed to bears being more common where human densities are lowest. However, if Maine’s bear population continues to grow and bears move into areas with higher human densities, conflicts could rise.

These conflicts, when they happen, tend to be mild in nature (the most common complaints we receive involve bears feeding at bird feeders and on garbage); but, if you live in a community that is experiencing these issues, they can be a great concern.

WHEN & WHY CONFLICTS HAPPEN





Most human-bear conflicts occur in the spring and early summer, after bears emerge from their winter dens and find it difficult to locate high-quality natural foods. As they search, they sometimes encounter food odors (bird seed, garbage, compost, and grills) that attract them to backyards and neighborhoods. Once berries begin to ripen

in late summer, bears return to wooded areas to forage and conflicts with humans decline. However, when these natural foods are not abundant, bears are more likely to continue searching for food provided by people.

SOLUTIONS

Many people expect the Department to move bears that are frequenting backyards, communities, and agricultural areas because it provides a quick fix to a problem. While this can provide a temporary solution to a property/livestock damage problem or a situation where human safety could be at risk, trapping and moving a bear is not always appropriate or effective. Bears that are trapped and transferred to a new area do not stay where they are released, and they often return or create a new problem somewhere else. Moving bears also puts them at a greater mortality risk, as they encounter more roads, other bears, and people.

Although it may seem simple to move or destroy the offending bear, the best solution is to remove or secure food, food odors, and other common bear attractants from your outdoor space every spring. If you don’t, bears will likely continue visiting. Even when bears are trapped and transferred to new areas, you should remove or secure attractants to avoid future problems. Here is a checklist that you can run through every spring:

<p>While hundreds of bear conflicts are reported each year, many can be prevented by simply removing or securing common bear attractants each spring.</p>		<p>1 REMOVE & STORE INSIDE BETWEEN APRIL 1 AND NOVEMBER 1</p>	<p>2 SECURE & CLEAN</p>
<p>BIRD SEED</p> 	<ul style="list-style-type: none"> • Take bird feeders down • Store seed and feeders indoors (you can still feed birds in the winter) 	<ul style="list-style-type: none"> • Rake up bird seed from the ground 	
<p>GARBAGE</p> 	<ul style="list-style-type: none"> • Store garbage cans in a building or enclosed by electric fence • Take to curb on morning of pickup 	<ul style="list-style-type: none"> • Keep outbuilding and garage doors closed at all times • Dumpster lids and doors should be kept closed and latched • Use bear-resistant dumpsters or garbage cans 	
<p>GRILLS</p> 	<ul style="list-style-type: none"> • Store grill inside when not in use • If you are having bear conflicts, stop grilling until bear moves on 	<ul style="list-style-type: none"> • Burn off food residue • Dispose of food wrappers and grease cups 	
<p>LIVESTOCK & PET FOOD</p> 	<ul style="list-style-type: none"> • Store livestock and pet food inside • Feed pets inside 	<p>If you feed your pets or livestock outside:</p> <ul style="list-style-type: none"> • Clean dishes daily • Remove leftover food daily 	

FOR MORE INFORMATION

We have revised our website and other outreach materials to provide additional information on what to do if you encounter a bear in your backyard, in your neighborhood, or during any outdoor activity in Maine. You can find that information, including printable/shareable PDFs, at: mefishwildlife.com/livingwithblackbears.

Black Bear Hunting and Trapping

SEASONS & PERMITS

MDIFW’s management of Maine’s black bears includes setting the season length, bag limit, and legal methods of hunting. Hunters (except for resident deer hunters during the firearm season) must purchase a bear permit, and each successful hunter must register their bear. The Department uses bear registration data to monitor harvest levels and adjust regulations as needed to meet bear harvest objectives.

The black bear hunting season opens the last Monday in August and closes the last Saturday in November, and is restricted to certain hunting methods during certain weeks.

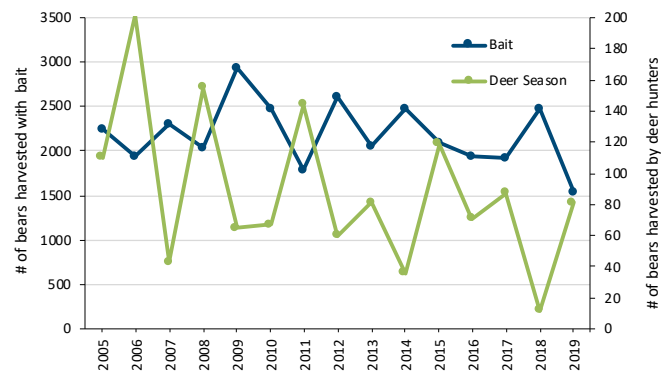
In 2018, hunting over bait was permitted from August 25 through September 22; and in 2019, it was allowed from August 24 through September 21. The hound (trained bear dogs) season overlaps with the last two weeks of the bait season, spanning September 10 to October 26, 2018 and September 9 to November 1, 2019. The annual trapping season opens September 1 and closes October 31. Hunters are allowed to hunt bears near natural food sources or by still-hunting throughout the entire three-month season. Bear hunters can take two bears if one is taken by trapping and the other by hunting.

During the 2018 and 2019 seasons, a similar number of bear hunters harvested two bears (25 in 2018 and 27 in 2019). More youth hunters successfully harvested a bear on youth day in 2018 (64) than did in 2019 (21).

ANNUAL HARVEST

Although many factors, including weather and hunter numbers, influence the black bear harvest, natural food levels play the largest role. Natural foods generally alternate in abundance from one year to the next. In a good food year, bears show less interest in bait sites and forage for plentiful foods through late fall. In a poor food year, bears show greater interest in bait and enter their winter dens early to conserve their limited fat reserves. As a result, harvest with the use of bait is typically higher in poor food years and lower in good food years, while harvest by deer hunters during the November firearm season is typically lower in poor food years and higher in good food years (Figure 2 and Figure 5).

FIGURE 2. HARVEST ALTERNATES WITH NATURAL FOODS. IN POOR FOOD YEARS, HARVEST BY BEAR HUNTERS USING BAIT IS HIGH AND HARVEST OF BEARS BY DEER HUNTERS IS LOW. TYPICALLY, A GOOD FOOD YEAR IS FOLLOWED BY A POOR FOOD YEAR.



We expected 2018 to be a poor natural food year for bears, and it was an *exceptionally* poor year. We saw a higher than average harvest over bait, with most of the annual harvest (92%) occurring by the end of September, at which point most bears made an early entrance into their winter dens. Despite the compressed timeline, hunters harvested a total of 3,314 bears (a near-record number) in 2018 (Table 1, Figure 3).

Also as expected, the 2019 season was a good food year, resulting in a lower harvest over bait. In fact, it was an exceptionally good food year for most berry and nut crops. As expected, the late-season harvest was higher than it was in 2018, but not high enough to increase the overall harvest since success rates by deer hunters remain relatively low even in a good food year. In fact, the 2019 bear harvest was nearly a record low with only 2,370 bears harvested during the entire 13-week fall season (Table 1.1, Figure 3).



2018

TABLE 1. NUMBER OF BEARS HARVESTED IN MAINE IN 2018 BY WILDLIFE MANAGEMENT DISTRICT (WMD).

WMD	METHOD OF TAKE						TOTAL HARVEST	ARCHERY ²	ASSISTED BY GUIDE	RESIDENT	NONRESIDENT
	HUNTING WITH BAIT	WHILE DEER HUNTING	HUNTING WITH DOGS	SPOT AND STALK	TRAPPING	UNKNOWN ¹					
1	134	0	29	0	5	0	168	10	148	28	140
2	133	0	32	0	1	0	166	10	158	15	151
3	154	0	11	3	2	0	170	13	138	41	129
4	194	0	19	0	0	0	213	28	162	64	150
5	107	0	50	1	2	0	160	12	145	24	136
6	184	0	24	6	7	0	221	20	151	70	151
7	126	0	45	1	5	0	177	14	107	75	102
8	196	0	71	2	12	0	281	8	180	139	142
9	95	1	22	0	2	0	120	9	79	40	80
10	106	0	28	1	2	0	137	5	111	34	103
11	169	0	70	3	3	0	245	12	194	59	186
12	128	0	45	3	11	0	187	16	80	112	75
13	42	2	16	0	1	0	61	3	34	32	29
14	48	1	32	2	0	0	83	5	68	31	52
15	65	3	34	5	5	0	112	8	21	93	19
16	3	0	1	1	0	0	5	0	1	4	1
17	41	2	10	1	6	0	60	3	16	48	12
18	165	0	27	0	8	0	200	13	126	108	92
19	120	0	67	0	2	0	189	12	171	28	161
20	16	2	6	2	0	0	26	3	2	24	2
21	3	0	0	0	0	0	3	0	0	3	0
22	0	0	0	0	0	0	0	0	0	0	0
23	2	0	0	0	0	0	2	0	0	2	0
24	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
26	58	1	3	0	3	0	65	3	11	60	5
27	42	0	5	1	5	0	53	7	22	27	26
28	153	0	45	2	4	0	204	13	135	88	116
29	0	0	0	0	1	0	1	0	1	1	0
UNREPORTED						5	5				
STATEWIDE	2,484	12	692	34	87	5	3,314	227	2,261	1,250	2,060

¹Unknown Method = Hunter did not report the method they used to harvest their bear.

²This does not include 62 bears harvested with a crossbow.



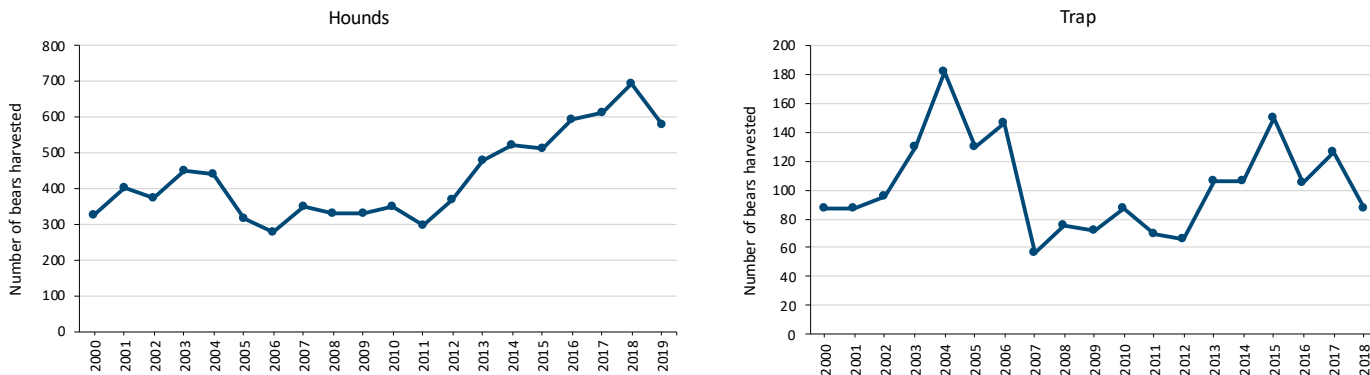
2019

TABLE 1.1 NUMBER OF BEARS HARVESTED IN MAINE IN 2019 BY WILDLIFE MANAGEMENT DISTRICT (WMD).

WMD	METHOD OF TAKE						TOTAL HARVEST	ARCHERY ²	ASSISTED BY GUIDE	RESIDENT	NONRESIDENT
	HUNTING WITH BAIT	WHILE DEER HUNTING	HUNTING WITH DOGS	SPOT AND STALK	TRAPPING	UNKNOWN ¹					
1	69	0	27	0	5	0	101	3	94	14	87
2	69	2	17	0	4	0	92	3	90	9	83
3	129	6	10	3	4	0	152	8	120	45	107
4	118	2	20	2	5	0	147	13	97	68	79
5	75	1	46	1	1	0	124	5	116	18	106
6	144	7	17	8	7	0	183	10	110	64	119
7	75	3	33	0	8	0	119	9	81	44	75
8	121	0	76	0	17	0	214	8	158	79	135
9	54	3	26	0	2	0	85	4	58	31	54
10	67	0	7	0	3	0	77	4	59	20	57
11	117	2	50	0	11	0	180	4	149	48	132
12	76	14	61	4	13	0	168	15	69	99	69
13	35	4	10	1	8	0	58	0	26	28	30
14	48	4	14	0	5	0	71	4	39	38	33
15	36	9	30	1	6	0	82	6	22	61	21
16	4	2	2	0	0	0	8	0	1	7	1
17	33	5	6	1	4	0	49	8	12	37	12
18	79	2	26	0	11	0	118	7	66	56	62
19	55	4	61	0	1	0	121	2	113	12	109
20	3	4	0	1	3	0	11	2	1	11	0
21	1	0	1	0	0	0	2	0	0	2	0
22	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
26	28	2	0	1	11	0	42	1	3	40	2
27	23	4	7	2	5	0	41	6	13	24	17
28	88	1	32	1	3	0	125	5	86	48	77
29	0	0	0	0	0	0	0	0	0	0	0
UNREPORTED											
STATEWIDE	1,547	81	579	26	137	0	2,370	127	1,583	903	1,467

¹Unknown Method = Hunter did not report the method they used to harvest their bear.

FIGURE 3. HARVEST BY HUNTERS USING HOUNDS (TRAINED BEAR DOGS) HAS BEEN INCREASING IN RECENT YEARS, WHERE PERIODS OF HIGH HARVEST BY TRAPPERS OCCURRED FOLLOWING THE 2004 AND 2014 BEAR REFERENDUMS THAT, IF PASSED, WOULD HAVE MADE IT ILLEGAL TO HARVEST BEARS WITH BAIT, TRAINED BEAR DOGS, OR TRAPS.



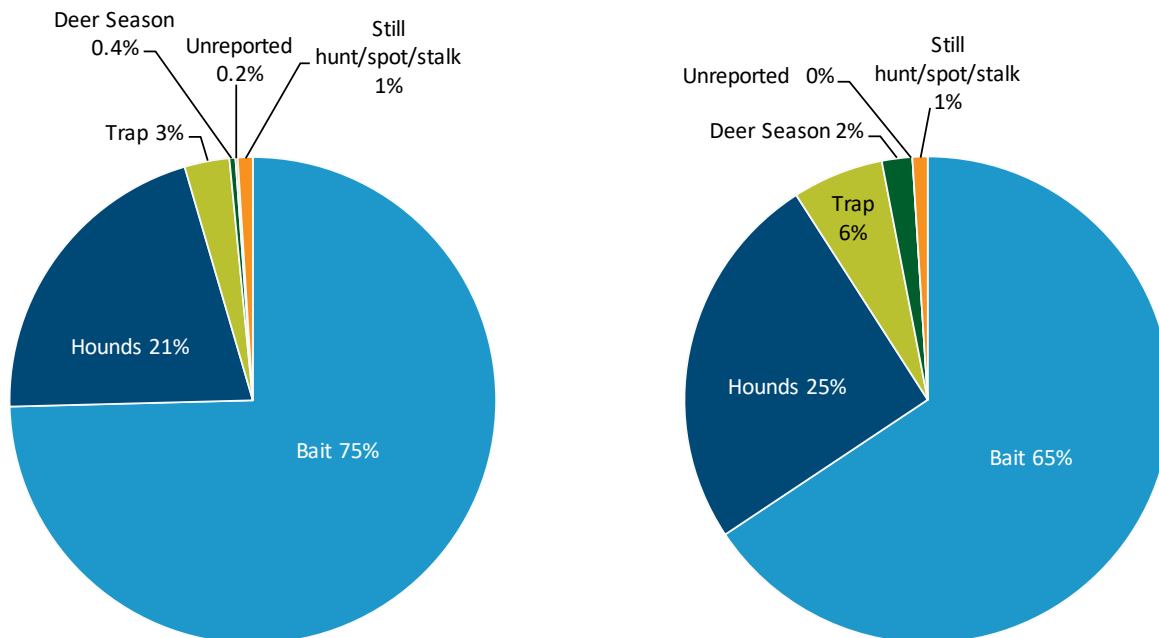
In Maine, most bears (90%) are harvested over bait or with trained bear dogs. Prior to 2012, approximately 80% of bears were harvested over bait and 10% by hunters using trained bear dogs. Since 2013, although bait remains the prominent method of harvest, a higher proportion (20%) have been harvested every year using trained bear dogs. This increase is likely in response to greater interest following a recent bear hunting referendum that, if passed, would have made hunting bears with bait, trained bear dogs, or traps illegal in Maine. We saw a similar increased interest in harvesting a bear with a trap following both the 2004 and 2014 bear referendums (Figure 3).

The role of the natural foods was clearly demonstrated in the 2018 and 2019 bear seasons. During the 2018 season, hunters harvested nearly 2,500 bears over bait, with that method accounting for 75% of the total harvest, and they harvested 692 bears with trained bear dogs, accounting for 21% of the annual harvest (Table 1 and Figure 4). Both of these harvest figures approached record highs. Later in the season, though, there was less opportunity. Due to a lack of natural foods, bears entered their winter dens early; and only 12 bears were harvested by deer hunters in November 2018 – a record low. The low number of trappers that harvested a black bear during the 2018 season was likely due to an emergency rule that limited the types of traps that could be set for bears during the 2018 season.

Conversely, in 2019, natural foods were both abundant and exceptionally diverse, giving bears a natural food source throughout the fall season. As a result, the total harvest was lower than average in 2019 with hunters only able to harvest 1,547 bears over bait (66% of the annual total) and 579 bears using trained bear dogs (Table 1.1). Hunters had more opportunity later in the 2019 season since bears were foraging longer on abundant natural foods and entered winter dens later (in some areas as late as December). Deer hunters in November harvested more bears, both in terms of the number (87) and the percentage of the total harvest it represented, but it was not high enough to offset the low harvest early in the 2019 season. An emergency rule in 2018 likely played a larger role than natural food levels on harvest by trappers. During the 2018 season, trapper effort was down following an emergency rule that limited certain traps, thus more trappers harvested bears in 2019 (137) than did in 2018 (87).



FIGURE 4. MOST BEARS IN MAINE WERE HARVESTED WITH BAIT AND HOUNDS (TRAINED BEAR DOGS) DURING THE 2018 AND 2019 SEASONS; HOWEVER, DUE TO THE ABUNDANCE OF NATURAL FOODS IN 2019, FEWER BEARS WERE HARVESTED OVER BAIT AND MORE WERE HARVESTED LATER IN THE SEASON BY DEER HUNTERS AND BEAR HUNTERS USING DOGS OR TRAPS.

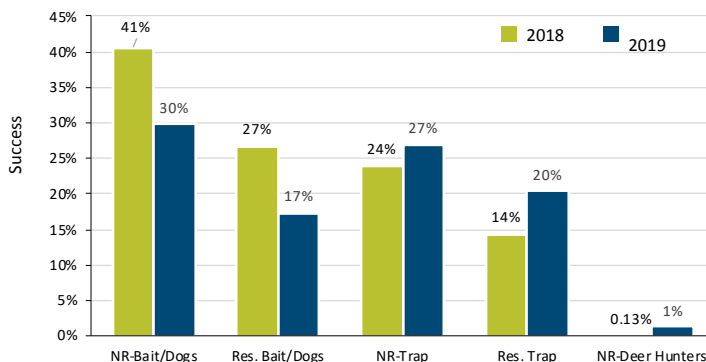
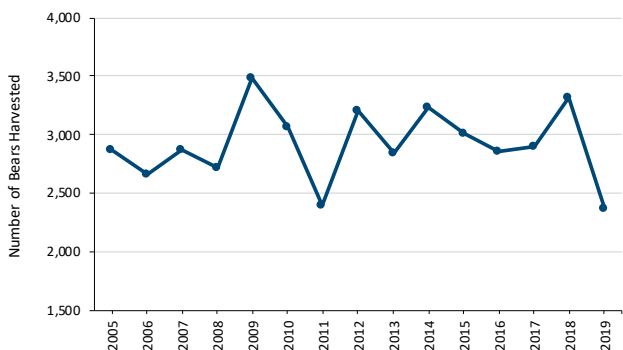


Since 2005, Maine’s annual bear harvest has averaged around 3,000 animals, which is below the level needed to stabilize the bear population. As a result, Maine’s bear population has been increasing by 2% to 4% annually. Although the 2018 harvest was higher than average, the harvest remained below objectives and the bear population continues to grow and expand in Maine. The lower annual harvest in Maine is influenced by declining hunter numbers (Figure 5).

In Maine, success rate is the highest among hunters that use bait or trained bear dogs, averaging between 25% and 35% since 2005. Success is also higher among nonresidents, most of whom hire licensed professional Maine hunting guides to assist them (37% vs. 29%). Hunter success rates were higher in 2018 than 2019, with most of the harvest taking place early in the season with the aid of dogs and bait (bears were highly responsive to bait in 2018 given the scarcity of natural foods). In 2019, because bears remained out foraging on abundant food late into the season, trappers and deer hunters had higher year-to-year success rates (Figure 6).

FIGURE 5. HARVEST GENERALLY ALTERNATES FROM YEAR TO YEAR IN RESPONSE TO NATURAL FOOD ABUNDANCE.

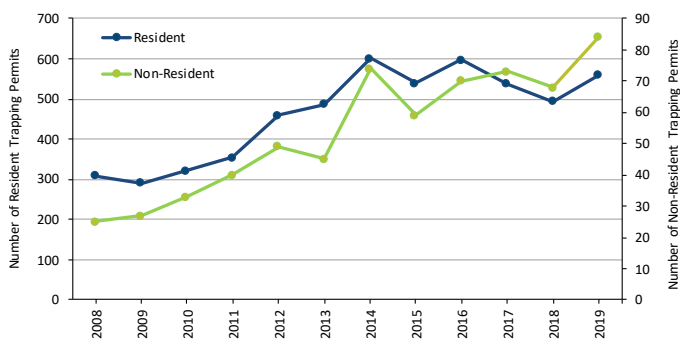
FIGURE 6. BEAR HUNTING SUCCESS RATES BASED ON PERMIT SALES BY RESIDENCE AND METHOD OF HARVEST.



BEAR TRAPPING

Trappers can harvest a bear in September or October using a cable foot restraint or a cage-style trap. Since 2008, trappers have been required to purchase a separate permit to trap a bear, and permit sales indicate rising interest, especially among residents. Trapping permit sales peaked in 2014 at 676, likely in response to a ballot initiative that, if passed, would have eliminated traps, bait, and trained bear dogs as legal harvest methods. However, in 2018, the number of bear trapping permits sold declined slightly to 494 for residents and 71 for nonresidents (Figure 7).

FIGURE 7. THE NUMBER OF RESIDENTS AND NONRESIDENTS PURCHASING A PERMIT TO TRAP BLACK BEARS IN MAINE HAS BEEN INCREASING.



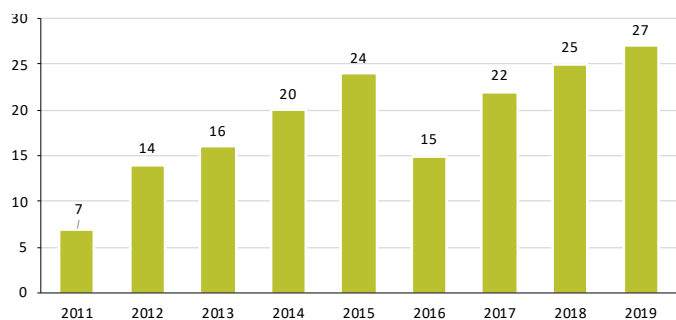
Just before the start of the 2018 bear trapping season, the Department passed an Emergency Rule limiting the types of traps that could be used to harvest black bears. The purpose of this rule was to give the Department more time to address the potential risks that certain traps could pose to bears and other animals incidentally captured in them; but it also likely resulted in lower trapper effort and harvest. During the 2018 season, 1,336 trappers harvested 87 bears – low numbers compared to each of the previous five years, during which an average of 1,485 trappers harvested anywhere between 100 and 150 bears.

In 2019, the Department passed a rule clarifying the design specifications of traps that would capture and hold bears by the foot, minimize potential injury to captured bears, and minimize non-target captures. This rule clarification likely improved trapping participation in 2019 (Figure 7), during which 1,432 trappers harvested 137 bears.

Since 2011, individuals have been allowed to harvest two bears each year if one is taken by hunting and the other by trapping. Although only a small proportion of hunters and

trappers take advantage of this opportunity, the number of individuals harvesting two bears increased incrementally each year to 24 hunters by 2015. In 2018, despite lower trapping effort, 25 hunters/trappers harvested a second bear. Similarly, 27 hunters/trappers harvested a second bear in 2019.

FIGURE 8. THE NUMBER OF HUNTERS THAT HARVEST TWO BEARS IS LIKELY LIMITED BY THE FACT THAT ONE MUST BE TAKEN IN A TRAP. SINCE THE 2011 BAG LIMIT INCREASE, AN AVERAGE OF 19 HUNTERS HAVE HARVESTED TWO BEARS IN A YEAR.



RESIDENT VS. NONRESIDENT HARVEST NUMBERS

As in past hunting seasons, nonresident hunters in 2018 and 2019 harvested most of the bears during the bait and hound (trained bear dogs) season. Conversely, resident hunters harvested most of the bears taken by spot and stalk methods, incidental to deer hunting, and in traps, but accounted for less than 200 bears in the harvest. Although the percentage of the harvest by nonresident hunters using spot and stalk methods remains low, it increased to 21% in 2018 and 15% in 2019. Similarly, the percentage of the harvest by nonresident hunters during deer hunting season, although also low, increased to 8% in 2018 and 11% in 2019.

THE INFLUENCE OF MAINE GUIDES

Most nonresidents use Maine Guides for their hunt, and that could explain their overall higher success rates leading up to deer firearm season (36% compared to 20% for Maine residents). Guides also appear to have boosted spot and stalk success, as the proportion of bears taken by spot and stalk methods with a Maine Guide also increased from 3% in 2016 to 18% in 2017 and 21% in 2018, but declined to 12% in 2019. The ease of finding bears over abundant natural foods in 2019 likely increased the success of hunters not employing a guide.

HUNTER PARTICIPATION

In 2003, permit fees were raised from \$5 to \$25 for residents and from \$25 to \$67 for nonresidents. Subsequently, bear hunting participation steeply dropped for residents and nonresidents alike. After a slight bump during the bear hunting referendum of 2004, numbers continued a steady decline before stabilizing at around 11,000 in 2009 (Figure 9).

RESIDENTS

Resident participation fell sharply with the permit fee increase. Active bear hunters were more likely to pay the fee, while those who previously purchased permits for the chance to take a bear while hunting other game largely opted out.

NONRESIDENTS

Nonresidents, who became more interested in hunting Maine black bears following the closure of the Ontario spring bear hunt in 1999, also lost some interest with the fee increase. While not as many nonresidents dropped off initially, the decline has continued, likely due to economics and increased opportunities to hunt bears in other states. This is particularly significant since nonresidents' higher success rates have a greater influence on the final harvest level (Figure 6).

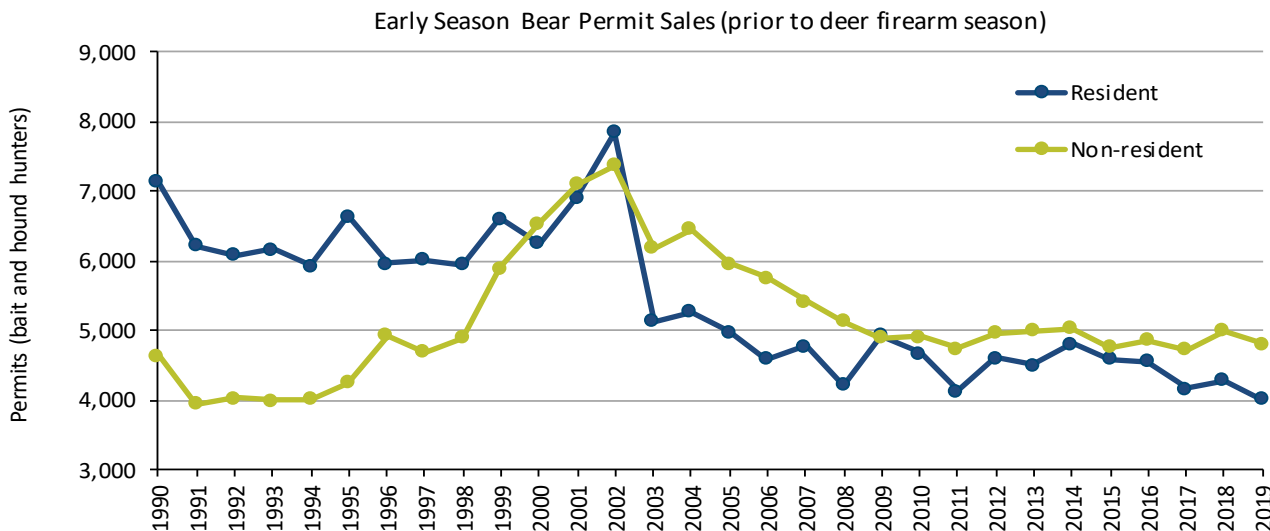
NEW PERMITS FUNDING BLACK BEAR RESEARCH AND MANAGEMENT

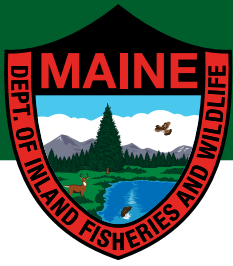
Since 2008, all trappers have been required to purchase a bear permit to harvest a bear, and nonresidents have also been required to purchase a permit to take a bear during deer firearms season. Funds from these permit sales are dedicated to bear research and management. Currently, we are using these funds to determine the age of harvested black bears from teeth turned in by the hunter, develop an integrated population model for bears, and evaluate the role of anthropogenic foods (including bait) on Maine's bear population. This research will allow us to improve our monitoring of trends in Maine's bear population, including its age structure and refine population estimates to better inform our management of bears.

Although the number of nonresident bear permit sales for deer hunting season has remained stable at 700 to 1,000 per year (774 in 2018 and 789 in 2019), sales of resident and nonresident bear trapping permits have been increasing. In 2014, likely due to a ballot initiative that would have made it illegal to harvest bears with bait, trained dogs, or traps, the number of resident trapping permits more than doubled from 291 to 602, and nonresident trapping permits tripled from 25 to 75. In 2018 and 2019, trapping permit sales reached 562 and 643 respectively, contributing more than \$40,000 to bear research and management.

This work is supported by the federal Pittman-Robertson program and state revenues from sales of hunting and trapping licenses.

FIGURE 9. THE DEPARTMENT DOES NOT LIMIT THE NUMBER OF BEAR HUNTING OR TRAPPING PERMITS. IN RECENT YEARS, RESIDENT AND NONRESIDENT BEAR PERMIT SALES HAVE STABILIZED TO APPROXIMATELY 10,000 WITH A SIMILAR NUMBER OF RESIDENTS AND NONRESIDENTS PURCHASING PERMITS. PRIOR TO 2003, MORE RESIDENTS PURCHASED BEAR PERMITS, LIKELY DUE TO THE LOW COST OF THE PERMIT AT THE TIME.





FURBEARERS

Shevenell Webb

Trapping and Furbearer Management

Sixteen species of furbearers live in Maine, including beaver, bobcat, coyote, fisher, gray and red fox, marten, mink, muskrat, opossum, river otter, raccoon, red squirrel, short and long tailed weasel, and skunk. Thanks to modern wildlife management principles, many of these species are more abundant now than they were 100 years ago.

The harvest of these species is a regulated activity that is strictly enforced by game wardens. MDIFW continually reviews and develops science-based regulations, education programs, and capture methods to ensure the harvest is sustainable and that practices are humane.

Trapping is the primary tool used to manage and maintain healthy populations of furbearers in Maine. Regulated trapping provides many benefits to wildlife and people and is used in a variety of situations, such as research, protection and restoration of rare species, managing populations, and resolving human-wildlife conflicts.

EXAMPLES

Aiding wildlife biology - MDIFW often uses trapping and release to track and study species populations. From 1999-2011, Department biologists studied Canada lynx in northern Maine to better understand their ecology (see lynx section for further description of this project). We captured 85 lynx using foothold traps, fitted them with radio-collars, and released them unharmed.

Managing predation - Trapping and removing the surplus of predators, like raccoon and skunk, is vital to the success of maintaining and restoring some sensitive species. We use trapping to manage predation of nesting colonies of coastal seabirds including the Atlantic Puffin, Roseate Tern, and the Common Eider; and the trapping of nest predators has helped to recover rare species including Piping Plover and Least Tern, who were on the brink of being lost from Maine's sandy beaches. In another example, research has documented mink and river otter populations increasing on islands located close to shore and negatively impacting



seabird nesting success and survival of seabird chicks and adults; but trapping has helped to protect and restore those islands' seabird populations.

Resolving human-wildlife conflicts - Furbearer harvest can also help mitigate human-wildlife conflicts.

Rabies is a disease that can be transmitted by all mammals but is most commonly found in raccoon, skunk, and fox. High populations of these species can result in disease outbreaks that can be a risk to humans, pets, and livestock. Trapping can help maintain healthy wildlife populations and remove sick animals if needed.

Beaver are nature's greatest engineers, but their activities can cause damage to roads, forests, and ornamental trees. Maine's abundant wetlands, rivers and lakes support a healthy beaver population, and trapping helps manage local beaver problems, balancing the maintenance of roads, properties, and beavers on the landscape.

MODERN-DAY TRAPPING

The Wildlife Society, American Association of Wildlife Veterinarians, and American Veterinary Medical Association support trapping as a valuable wildlife management tool. Maine law requires that new trappers complete a trapper education course, which covers the most up-to-date information on humane trapping tools and techniques. For over 20 years, state wildlife agencies have worked closely with the U.S. Department of Agriculture, state trapping associations, and veterinarians to develop best management practices (BMP's) for trapping. This program has established high quality standards for modern day trapping to be efficient, selective, practical, safe, and humane. Wildlife biologists and trappers support BMP's because they are passionate about the welfare of wildlife. To learn more about trapping regulations and furbearer management, please visit maine.gov/ifw or furbearermanagement.com.



Furbearer Planning

In 2019, the Department started a Furbearer Planning initiative. One of the first steps is to survey the public on their knowledge, attitudes, and concerns regarding furbearers and management options. We are looking forward to getting input from the public and learning more about how people engage with furbearers in Maine. This information will factor in to new Management Plans for six species groups: Beaver/Otter, Mink/Muskrat, Canids, Bobcat, Marten/Fisher, and Other Furbearers.

A Steering Committee made up of diverse wildlife stakeholder groups will be responsible for guiding this plan, and working groups with technical expertise will develop management goals, objectives, and strategies. Given the wide scope and number of species, this will be a multi-year project.

HARVEST UPDATE

In fall of 2019, we launched an online registration system for furbearers. In the past, to collect furbearer harvest data, Department staff or local businesses filled out fur cards and sent them all in at the end of the season for data entry. The new online system is a much more efficient and accurate tool.

The pelts of all furbearers, except weasels, raccoon, red squirrel, muskrat, skunk, and opossum, are required to be registered and tagged. Furbearers are primarily trapped, but fox, coyote, bobcat, raccoon, opossum, and skunk can also be hunted during a limited time of the year. Small game that can be hunted include snowshoe hare, red and gray squirrel, woodchuck, and porcupine. Tagging pelts gives the Department information on who harvested the animal, harvest method, town where it was taken, and month and year of harvest.

During the 2019 season, harvests were comparable to the previous three-year average (2016-2018), but far below historic trends (2006-2015; **Table 1**). Compared to recent trends, we saw an increase in some species, including bobcat, coyote, beaver, and river otter.

The low harvest in recent years can be attributed to trapping regulations, low pelt prices, and low trapper effort. In 2015, statewide trapping regulations were implemented to protect Canada lynx, requiring lynx exclusion devices for body-gripping traps on dry land and chain-and-swivel configurations for foothold traps. The number of trappers that had a license last year was similar to recent years, but the number of trappers tagging fur declined by ~50% compared to five years ago.

Also in 2019, a new electronic survey was developed for trappers to complete their Fall and Spring Harvest Reports online. We had 1,550 fall and 500 winter/ spring trapper harvest reports returned for the 2019 season. Additional reports have been received but not entered at the time of reporting, so the final number of reports will not be available until late summer of 2020. 53% of the harvest reports indicated that a trapper did not trap for furbearers during the fall season. Lack of time was the top reason for not trapping (55%), followed by trapping regulations (18%) and health issues (15%), as reported on the online portion of the Fall Harvest Report. Natural foods, like beechnuts and acorns, were in high abundance during the fall of 2019, which made it more difficult to catch some species.

TABLE 1. FURBEARER HARVESTS FOR THE 2019-20 TRAPPING AND HUNTING SEASON, AS COMPARED TO PAST TRENDS IN MAINE¹.

SPECIES	2019	3 YR AVG 2016-2018 AVERAGE	10 YR AVG 2006-2015 AVERAGE
Beaver	6,209	4,338	8,687
Bobcat	352	236	291
Coyote	1,909	1,468	1,728
Fisher	365	451	1,067
Red Fox	458	581	850
Gray Fox	248	197	301
Marten	315	859	2,174
Mink	335	435	1,765
Otter	678	458	705

¹ 2019-20 harvest data was updated to animals registered by June 2, 2020. Imports and roadkills were excluded from this summary.

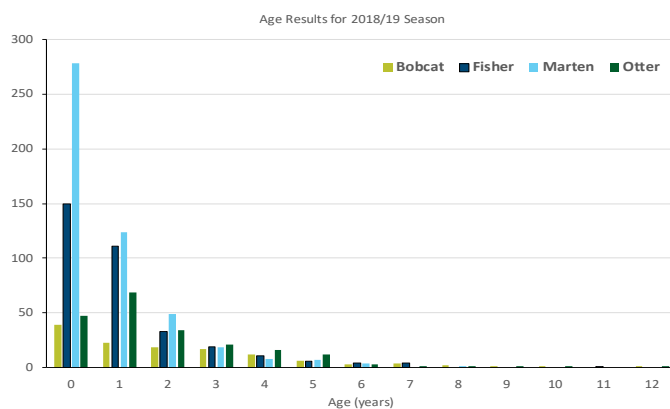
Tooth Submissions

In 2016, the Department began requiring trappers and hunters to submit tooth samples of all bobcat, fisher, marten, and otter harvested. The age and sex data collected from these samples provide insight into how intensively these species are being harvested. When multiple years of age and sex data are combined with overall harvest numbers and trapper effort, biologists will be able to use mathematical modeling to develop population trends for these species.

YEAR 1 (2016-2017)

For the 2016 season, 1,602 tooth samples were submitted, representing 42% of the bobcat, 83% of the fisher, 79% of the marten, and 97% of the otter harvest(s) with age information. The number of teeth submitted was exceptional for the first year of the program, especially considering the delay in publicizing information on the new rule. In general, most of the animals that were harvested tended to be younger, particularly for marten and fisher.

FIGURE 1. TOOTH RESULTS FOR BOBCAT, FISHER, MARTEN, AND OTTER HARVESTED DURING THE 2018 SEASON.



YEAR 2 (2017-2018)

For the 2017 season, the Department received 1,134 samples, representing at least 47% of the bobcat, 65% of the fisher, 63% of the marten, and 60% of the otter harvest. We saw similar age and sex trends for the 2016 and 2017 seasons. For bobcat, the percent kitten was 21% and 28%, percent adult (two years and older) was 50% and 41%, and male to female ratio (reported by hunters and trappers) was 0.9 and 0.86 for the 2016 and 2017 seasons. For fisher, the percent juvenile (<1 years old) was 48% and 57% and the male to female ratio was 0.48 and 0.6 for the 2016 and 2017 seasons. From discussions with trappers, we understand that the lynx exclusion devices are more conducive for catching female fisher because the larger males don't like to enter the cage with a baffle. Although the percent female is higher than males, the annual fisher harvest has declined by 50% since 2015, so the total number of female fisher taken is relatively low. For marten, 40% and 43% of the samples were juveniles (<1 years old), and the male to female ratio was 2.1 and 2.4 for the 2016 and 2017 seasons. For otter, 32% and 18% of the samples were juveniles (<1 years old), and the male to female ratio was 1.4 and 1.7 for the 2016 and 2017 seasons. During the 2017 season, a 14-year old male otter was taken, becoming the oldest otter recorded in Maine.

YEAR 3 (2018-2019)

For the 2018 season, the Department received 1,175 viable tooth samples (Figure 1). We determined that bobcat milk teeth (<1 years old) can be easily distinguished, so we cut costs by retaining these teeth. The age and sex results for the 2018 season were similar to the previous two years. The oldest age since the study began was 12 years old for bobcat, 11 years old for fisher, nine years old for marten, and 14 years old for otter.

The 2019 samples are being cleaned and prepped to send to the lab later this fall, with age results anticipated late winter/spring of 2021. The age and sex data collected from these samples continues to provide insight into how intensively these species are being harvested and improves the management of these species.

Rabies Update

Wildlife are tested for rabies when there has been potential exposure (typically a bite or direct contact) with humans or pets. Maine Department of Human Services reported 89 animals tested positive for rabies in 2019, which was higher than the previous five-year average (average = 55, range = 28-76 animals from 2014-2018). Every year, raccoon and skunk consistently represent the vast majority of cases.

Some areas of midcoast Maine have been hit particularly hard by rabies in recent years. In 2019, the City of Bath, with a population of over 8,000 people, received 72 suspicious animal calls. 26 sick animals were dispatched by officers or citizens and 16 animals tested positive for rabies. Of the 18 fox attacks on people or pets, 11 resulted in a person being bitten or scratched. The unusual number of aggressive grey fox attacks on people and pets over a 14-month timespan raised human health and safety concerns and prompted a focused trapping effort to remove rabies vector species to reduce human-wildlife interactions.

Meanwhile, USDA Wildlife Services continues its Oral Rabies Vaccine (ORV) Program in Maine, primarily focused on the Maine/New Brunswick border. The goal of the program is to prevent the further spread of wildlife rabies and eventually eliminate terrestrial rabies in the United States. In August 2019, the program distributed approximately 351,000 rabies vaccine baits around the town of Houlton by airplane and vehicle.

Learn more about annual rabies trends at maine.gov/dhhs/mecdc/public-health-systems/health-and-environmental-testing/rabies/rabies.htm.

GAME BIRD CONSERVATION & MANAGEMENT

MEET THE GAME BIRD GROUP



Brad Allen, Wildlife Biologist and Bird Group Leader

Brad oversees bird group activities and budgets and continues to investigate the lives and times of the common eider, focusing currently on a collaborative duckling survival study. Brad also coordinates Department interests in seabird research and management activities.



Kelsey Sullivan Wildlife Biologist

Kelsey coordinates MDIFW's waterfowl banding programs, surveys, and research to assess the status of game bird populations in Maine. Game bird species that Kelsey is responsible for include ruffed grouse, American woodcock, wild turkeys, waterfowl, and Canada geese. He is Maine's representative on the Atlantic Flyway Council Technical Section.



RESIDENT GAME BIRDS

Kelsey Sullivan

Wild Turkey Fall 2019 Harvest Summary

The fall wild turkey season opened two weeks earlier in 2019 to expand hunting opportunity and encourage more harvest in Wildlife Management Districts (WMDs) with high wild turkey densities. For the same reason, the bag limits in WMDs 15, 16, 17 and 20-25 were increased from two to five birds. Despite these liberalizations, the total harvest was 1,980 turkeys — on par with the seven-year trend as seen below in **Table 1** and **Figure 1**.

Fall turkey harvests can be influenced by the abundance of natural foods, such as acorns. In years when acorns are abundant and widely distributed (a high mast crop year), turkeys are widely distributed across the landscape. This makes encountering turkeys in the fall less frequent and the total season harvest tends to be lower. Fall 2019 was a high acorn mast crop year, decreasing the likelihood of turkey encounters; and as a result, very few wild turkey hunters took a full season bag limit of five birds last fall. 29 hunters tagged five wild turkeys, 42 took four, and 94 took three.

In low mast years when turkeys are concentrated and more likely to be encountered, we predict the fall harvest will be higher than it was this year and closer to what we saw during the previous fall (2018), when low mast crops and very successful summer wild turkey reproduction led to high harvest numbers.

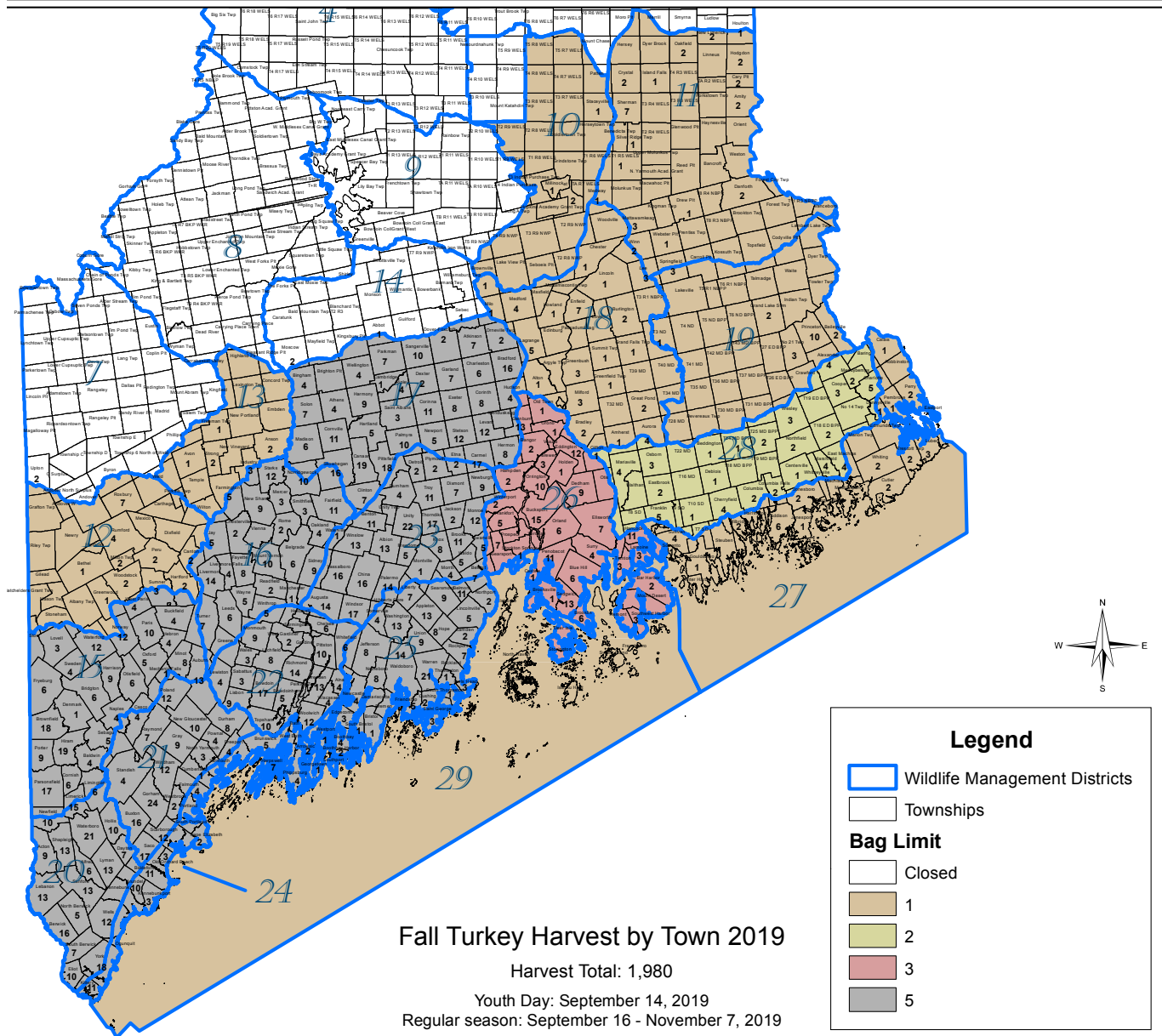


TABLE 1. WILD TURKEY SPRING AND FALL SEASON HARVEST TOTALS

SEASON	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SPRING	6,078	5,448	6,084	6,704	5,779	5,272	5,852	5,597	6,236	6,612
FALL	-	-	-	2,183	1,802	2,718	2,627	1,532	3,507	1,982



FIGURE 1. FALL 2019 HARVEST MAP DEPICTING BAG LIMITS AND HARVESTS. (NOTE: TOTAL HARVEST ON THIS MAP WAS PRELIMINARY TO FINAL COUNT OF 1,982)



Wild Turkey Research Project: Population Assessment and Harvest Management

The Maine Department of Inland Fisheries and Wildlife and the University of Maine at Orono's Department of Wildlife, Fisheries and Conservation Biology have completed the 3rd winter field season capturing, banding and marking wild turkeys with radio telemetry units. This effort is part of a research project designed to evaluate various aspects of the State's wild turkey population. A total of 373 wild turkeys were captured this winter. All received leg bands and 81 received radio telemetry units. In total, over the three winter field seasons, 894 wild turkeys were captured across several Wildlife Management Districts, all receiving leg bands and 270 receiving a radio telemetry unit. The telemetry units allow us to keep track of where turkeys are throughout the year. Wild turkeys with bands that are harvested should be reported and allow us to understand both harvest rate and dispersal from wintering areas where they were captured.

The need for research was identified in the Department's recent Big Game Management Plan, which incorporated public input into wild turkey management moving forward. The plan identified the need to scientifically evaluate various aspects of wild turkey ecology specific to Maine and incorporate this information into our wild turkey management system. These aspects include nesting behavior and timing, nesting success, seasonal and annual survival of turkeys, habitat use and movement across the landscape as well as the role disease has in wild turkey ecology.

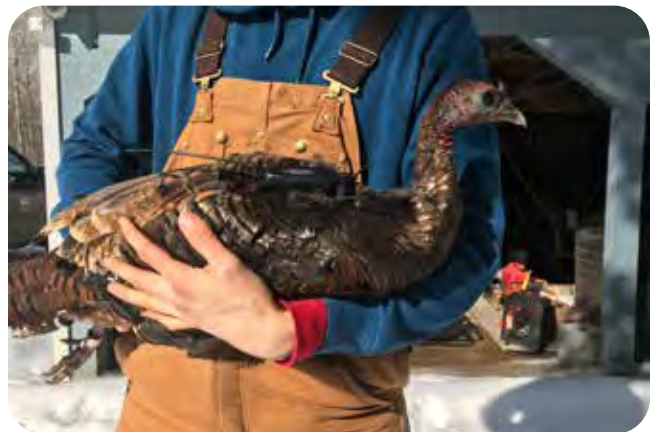
For more information on the project you can visit our project website at wildturkeyme.org.



Banded Tom Turkey in Albion (2019). Photo by Kelsey Sullivan.



Netting three Tom turkeys in Hampden (2020). Photo by Robert Michelson www.pbmphoto.com



Hen wild turkey with GPS/radio transmitter (Hampden 2020). Photo by Kelsey Sullivan

Wild Turkey Spring Harvest

Maine continues to have a quality wild turkey spring hunting season in recent years. As with many ground-nesting upland game bird populations, the wild turkey population fluctuates annually based on factors such as weather conditions, predator numbers, and reproductive success. The number of wild turkeys harvested in the spring is related to these annual fluctuations, which can naturally limit the number of turkeys available to hunt.

The table below shows the spring wild turkey harvest from 2015 to 2019 by Wildlife Management District (WMD). The Spring 2015 season followed one of Maine’s coldest, snowiest winters in recent memory. Winter conditions affect wild turkey survival, a relationship reflected in the lower 2015 spring harvest.

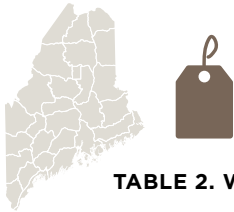


TABLE 2. WILD TURKEY SPRING SEASON HARVEST TOTALS BY WILDLIFE MANAGEMENT DISTRICT.

WMD	2015 HARVEST	2016 HARVEST	2017 HARVEST	2018 HARVEST	2019 HARVEST	5 YEAR AVERAGE
1	1	-	5	3		3
2	7	8	6	4	5	6
3	8	21	12	3	6	10
4	2	1		1	1	1
5	4	4	7	2	6	5
6	49	36	25	48	49	41
7	56	70	53	29	52	52
8	3	21	3	7	14	10
9	3	9	8	6	4	6
10	6	8	7	9	4	7
11	49	60	48	71	75	61
12	210	185	214	91	176	175
13	139	118	78	117	122	115
14	55	54	52	43	55	52
15	538	636	537	643	592	589
16	371	388	440	455	523	435
17	536	642	555	675	603	602
18	86	93	64	118	104	93
19	24	14	24	28	20	22
20	460	473	781	604	705	605
21	484	547	485	608	666	558
22	371	528	551	571	607	526
23	478	518	478	754	765	599
24	463	431	195	174	172	287
25	443	454	496	586	687	533
26	286	378	354	450	456	385
27	70	73	43	70	68	65
28	35	53	47	40	67	48
29	15	16	28	20	8	17
TOTAL	5,265	5,848	5,596	6,147	6,612	5,894

Grouse

MDIFW surveys and compiles data by geographic region and calculates the number of grouse seen per 100 hours of moose hunting effort (**Table 3**). Survey results show that the Northwest section (much of the North Maine Woods) observed had many grouse in the fall of 2018, with

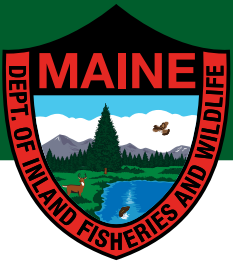
117 seen per 100 hours of moose hunting. This was the second-highest count since the survey began (the highest was in 1995, with 125 grouse/100 hours). Other sections of the state, such as the Northeast, also showed high counts. Overall, 2018 was a good year for grouse.



TABLE 3. STATEWIDE GROUSE SURVEY OF MOOSE HUNTERS AND OTHERS IN THEIR HUNTING PARTY DURING THE MOOSE HUNTING SEASONS (2008-2018).

METRIC	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
COMPLETE SURVEYS	-	1,875	1,332	1,343	1,374	1,220	513	961	229	345	893
TOTAL GROUSE SEEN	-	22,225	15,967	17,072	18,946	14,992	8,664	4,722	2,405	3,761	5,808
GROUSE /100 HOURS	30	50	49	43	47	35	52	43	25	41	70

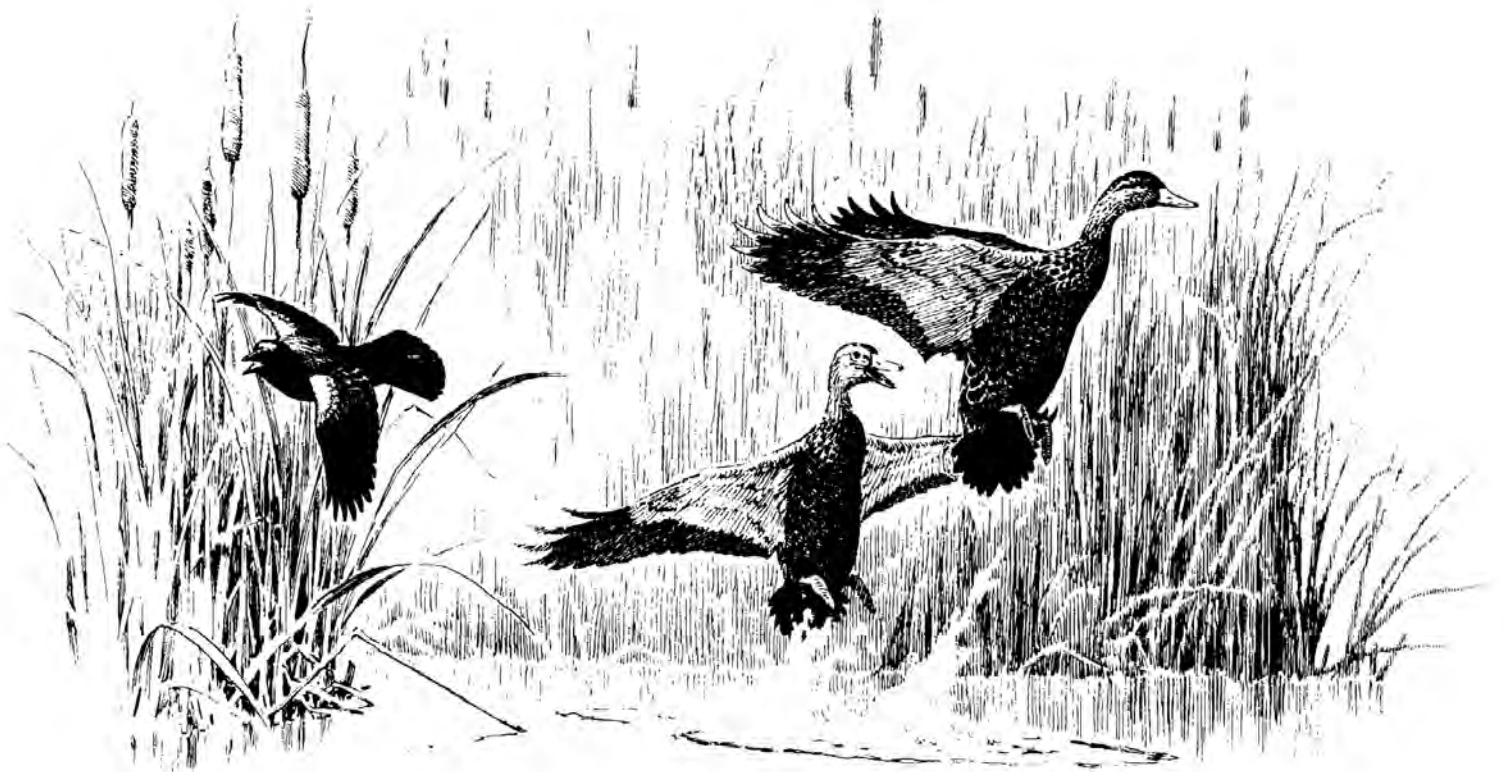




MIGRATORY GAME BIRDS

Kelsey Sullivan

MDIFW collaborates with the USFWS to monitor migratory game bird populations and assess their harvest. To monitor populations, we conduct several surveys throughout the year specific to migratory bird species groups, such as sea ducks and dabbling ducks, Canada geese, and American woodcock.



WATERFOWL HARVEST

The 2018-19 Maine regular waterfowl season selection continued with three zones: North, South, and Coastal. The federal framework offered states in the Atlantic Flyway a 60-day duck season with a six-bird daily bag limit and a 60-day Canada goose season with a two-bird daily bag limit. The season also allowed for additional hunting days to compensate for state-imposed Sunday hunting prohibitions.

The special sea duck season in the Atlantic Flyway and Maine was again limited to 60 days with a daily limit of five sea ducks per day with no more than four scoters, four eiders, or four long-tailed ducks per day.

In addition to the regular Canada goose season, a special early Canada goose season was open from September 1 to September 25. The early season daily bag limit was 10 in the South and Coastal zones and six in the North zone. Harvest rates for resident Canada geese over the last five years have been between 14 and 17 percent based on banding of resident Canada geese in Maine in July.

Table 4 below presents the results of the Harvest Information Program (HIP) waterfowl harvest surveys for the 2015-16, 2016-17, 2017-18 and 2018-19 hunting seasons.



TABLE 4. MAINE DUCK AND GOOSE HARVEST ESTIMATES BASED ON HARVEST INFORMATION PROGRAM, 2015/16-2018/19.

	2015-16	2016-17	2017-18	2018-19
Black Duck	807	2,700	2,900	5,600
Mallard	4,159	8,000	9,700	11,800
Mallard X Black Duck Hybrid	31	100	200	100
Green-Winged Teal	1,242	1,900	1,600	1,100
Blue-Winged Teal	62	200	0	0
Northern Shoveler	0	0	100	0
Northern Pintail	93	100	200	400
Wigeon	62	100	0	200
Wood Duck	3,166	5,500	6,500	3,700
Greater Scaup	31	0	0	100
Lesser Scaup	93	100	0	0
Ring-Necked Duck	217	800	200	800
Bufflehead	1,024	2,500	1,500	2,700
Common Goldeneye	497	600	600	700
Hooded Merganser	279	600	600	600
Other Mergansers	372	700	500	700
Total Dabbling/Diving Duck Harvest	12,119	27,000	32,200	39,400
Seasonal Duck Harvest Per Hunter	3.7	5.9	5.3	5.7
Canada Goose	7,196	11,400	15,200	11,400
Seasonal Goose Harvest Per Hunter	3.8	4	4.4	4.5
Common Eider	917	1,800	5,700	7,300
Long-Tailed Duck	423	800	1,700	2,600
Scoter Species	141	1,100	1,300	800
TOTAL SEA DUCK HARVEST	1,481	3,700	8,700	10,700



American Woodcock

Department biologists contribute data annually to the USFWS American Woodcock Singing-ground Survey (SGS). In the spring of 2019, MDIFW staff, USFWS staff, and several volunteers completed 50 SGS routes in Maine, during which the average number of males heard was 3.42 – slightly higher than the 2018 average of 3.01 and slightly higher than the 10-year average of 3.72. When all state's data are summarized, woodcock populations in the eastern region show a significant negative trend over the most recent 10 years (2009-2019).

Woodcock hunting season

As with waterfowl, the Harvest Information Program (HIP) provides statistically valid estimates of woodcock hunter numbers and harvest. Based on HIP data, approximately 3,800 woodcock hunters harvested an estimated 9,700 woodcock in Maine in 2018. Maine is one of the most important woodcock hunting states in the eastern region based on total harvests. The recruitment index of 1.8 immature (young of the year) to one adult female in the 2018 harvest was slightly above the long-term average of 1.7 young/adult female (1963–2017). The recruitment index is a measure of the ratio of immature woodcock per adult female derived from a wing-collection survey. Maine hunters provided 739 woodcock wings from their 2018 hunting season efforts.