2021 Maine Peregrine Falcon Program Report

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Photo by Trish Berube

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Executive Summary

Photo by Jose Rodriguez

By the 1960s, peregrine falcons nearly disappeared across the country due to the widespread use of the pesticide DDT. A ban on this environmental contaminant, along with species restoration efforts, resulted in a resurgence of peregrine numbers. The species was Federally delisted in 1999, however the Maine breeding population is still considered endangered. Despite the positive trend since reintroduction, the peregrine population is small and continues to benefit from monitoring and management.

Peregrine conservation efforts in Maine this year were a great success. A draft conservation plan was completed and is expected to be available for public review in 2022. Nine hatch year birds were affixed with leg bands and seven nest structures were placed at locations where pairs benefitted from safer accommodations. To better understand the current population status and interannual variation, resources were allocated to conduct the third consecutive year of statewide surveys. Breeding surveys were completed thanks to numerous observers who followed a standardized survey protocol and submitted observations into a data management software called NestStory.

The 2021 Maine peregrine falcon population consisted of 41 pairs with 31 breeding pairs documented. Of the 31 pairs that attempted to nest, 27 pairs were successful and hatched 58 chicks and produced 50 fledglings (≥ 28 days old), with 34 young observed at the flight stage. The overall productivity rate was 1.22 fledglings per occupied territory (50 fledglings/41 pairs). An occupied territory is where either a pair is present or there is evidence of reproduction (e.g. adult incubating, eggs, young, food delivered to nest [USFWS 2003]). Most pairs were present on cliffs (56%), but also present on buildings (including transmission towers, cell towers, light structures, and lighthouses, 20%), quarries (12%), bridges (7%), and previously used osprey nests (5%).

Efforts focus on directly influencing statewide peregrine population levels to attain stability in Maine and throughout the Northeast. By addressing knowledge gaps, potential threats, and connecting with the public we will work towards assuring species recovery and population stability.

If you have questions, comments, or would like to join our efforts (e.g. participate in standardized surveys, construction/placement of nest trays/boxes, etc.) please contact Erynn Call, erynn.call@maine.gov. Additionally, any observations of peregrine falcons can be reported at Maine eBird. Always feel free to contact the Maine Department of Inland Fisheries and Wildlife at (207) 287-8000 or at maine.gov/ifw.

Acknowledgements

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Photo by Trish Berube

Background

The peregrine falcon (*Falco peregrinus*; hereafter peregrine) nearly disappeared from the continental United States due to widespread use of the pesticide DDT. The Eastern population was historically rare and considered extirpated by 1964 (Enderson et al. 1995). Following the listing in 1970 as a Federally endangered species, recovery efforts included a ban on DDT and other environmental contaminants, as well as successful captive breeding programs. These efforts led to consideration of species delisting based upon the following criteria: 1) population size and trend, 2) reproductive performance, 3) pesticide residue in eggs, and 4) eggshell thickness. Goals were met associated with each of the four regional recovery plans and the species was subsequently Federally delisted in 1999 (U.S. Fish and Wildlife Service 1999).

Peregrines in Maine are identified as part of the reintroduced breeding population, Tundra subspecies, or American subspecies. The reintroduced breeding peregrines, currently listed as an endangered species in Maine, are a genetic mix of the many birds that were part of the captive breeding program. These birds were identified only by species because of the mix of subspecies and races from around the world. In Maine, a total of 144 birds were released from 1984 to 1997. This reintroduced population breeds within the state and often stays close to their breeding territory throughout the year. In contrast, the Tundra subspecies does not breed in Maine but migrates and travels through in April and May and mid-September through October. This subspecies was Federally delisted in 1994, is not currently State listed, and their numbers continue to increase. The American subspecies was historically found in Maine before they completely disappeared from the state due to DDT.

The recovery of peregrines in Maine and the entire Northeast has been a success; however, they are still listed as an endangered, threatened, or species of special concern in many states along the east coast and continue to benefit from focused monitoring and management due to their small population size. Banding and re-sighting efforts document inter-state movements of this metapopulation (Faccio et al. 2013). Consequently, it's important to think about species recovery across state boundaries. The first post-recovery nesting in Maine was documented in 1987, and by 2002 there were 15 breeding pairs. In 2003, U.S. Fish and Wildlife Service (USFWS) initiated the first of five nationwide monitoring efforts as part of the post-delisting monitoring plan (Green 2003). Maine participated in these post-delisting surveys, but logistical challenges limited statewide monitoring of eyries.

Photo by Trish Berube

Based on the research objectives, questions, assessments of peregrine status, and survey results, MDIFW works to facilitate conservation actions intended to directly influence statewide peregrine population levels and share their story with the public. These efforts will incorporate long-range strategic planning considerations to attain stable peregrine populations in Maine and contribute to metapopulation stability throughout the Northeast.

Survey Methods

Contact author for unabridged survey methods and details on survey sites.

Statewide survey frequency (new info make note!) **-** This year (2021) marks the last of three-consecutive years of statewide peregrine breeding surveys. Prior to this survey window, statewide surveys were conducted once every five years. In 2019, it was decided to complete three consecutive years to better assess population status and capture interannual variation. This also helped build momentum in discovering new pairs, partners, and surveyors. As part of the statewide peregrine conservation plan (currently under internal review), we are proposing to forgo *statewide* surveys for five years (2022 – 2026), and then complete three years of consecutive *statewide* surveys (2027 – 2029). The state endangered and threatened species review will occur in 2030 and data from the prior three years would be available as part of the peregrine falcon species listing assessment.

Beginning in 2022, annual surveys will only take place at sites that benefit from management intervention or sites that are easily observed with dedicated observers who enjoy reporting breeding activity. Management intervention may include trail closures or reroutes at cliff sites and strategies to limit disturbance from activity at urban sites such as bridges, buildings, quarries. These sites may provide opportunities for banding of young, outreach, and contaminant sampling. We will investigate reports of new breeding pairs each year as logistically possible.

Site selection - Effort focused mostly on known (priority 1) but also included potential (priority 2 and 3) sites (Figure 1, see Appendix 1 for map of sites and MDIFW regions). Note as mentioned in the prior section, site selection for surveys in 2022 will focus on locations that require some type of management intervention or report of a new breeding pair.

Survey frequency - Sites were visited two or more times to determine occupancy, nest success, and productivity (U.S. Fish and Wildlife Service, 2003). The first visit occurred during courtship, egg laying, or early incubation to determine occupancy; a second visit occurred during the early nestling stage to determine the age of the young, or to check the 'unoccupied' status of territories still in question; and a third visit (or more) was made to occupied territories during the late nestling stage, when young were 28-42 days old to determine nest success and productivity. A follow-up survey within three weeks was conducted if a single adult was observed at the site or if the location of the eyrie was unknown. If young were not detected at sites where a territorial pair was observed prior, a follow-up visit verified nest failure. Additional surveys beyond these minimums occurred depending on surveyor availability and management needs.

Survey duration - Surveys were up to four hours long, as peregrines will often either change incubation duties, cache or deliver food to young within a four-hour span and thus be visible. A minimum of two four-hour observation periods separated by three weeks were necessary to

assume a site was unoccupied. A combination of smaller observation periods was not enough to infer an absence of resident peregrine(s) with much confidence.

The survey was four hours if:
1) no birds were observed
2) a single bird was observed
3) location of eyrie unknown during the incubation or fledgling phase, (~after April 15)
4) presence of nestlings/fledglings not known (~after May 15)

The survey was less than four hours if:
1) pair observed during courtship phase (~Mar 15 – April 15), perched conspicuously or copulating (i.e. clearly not tending a nest)
2) presence of nestlings/fledglings is known (~after May 15)

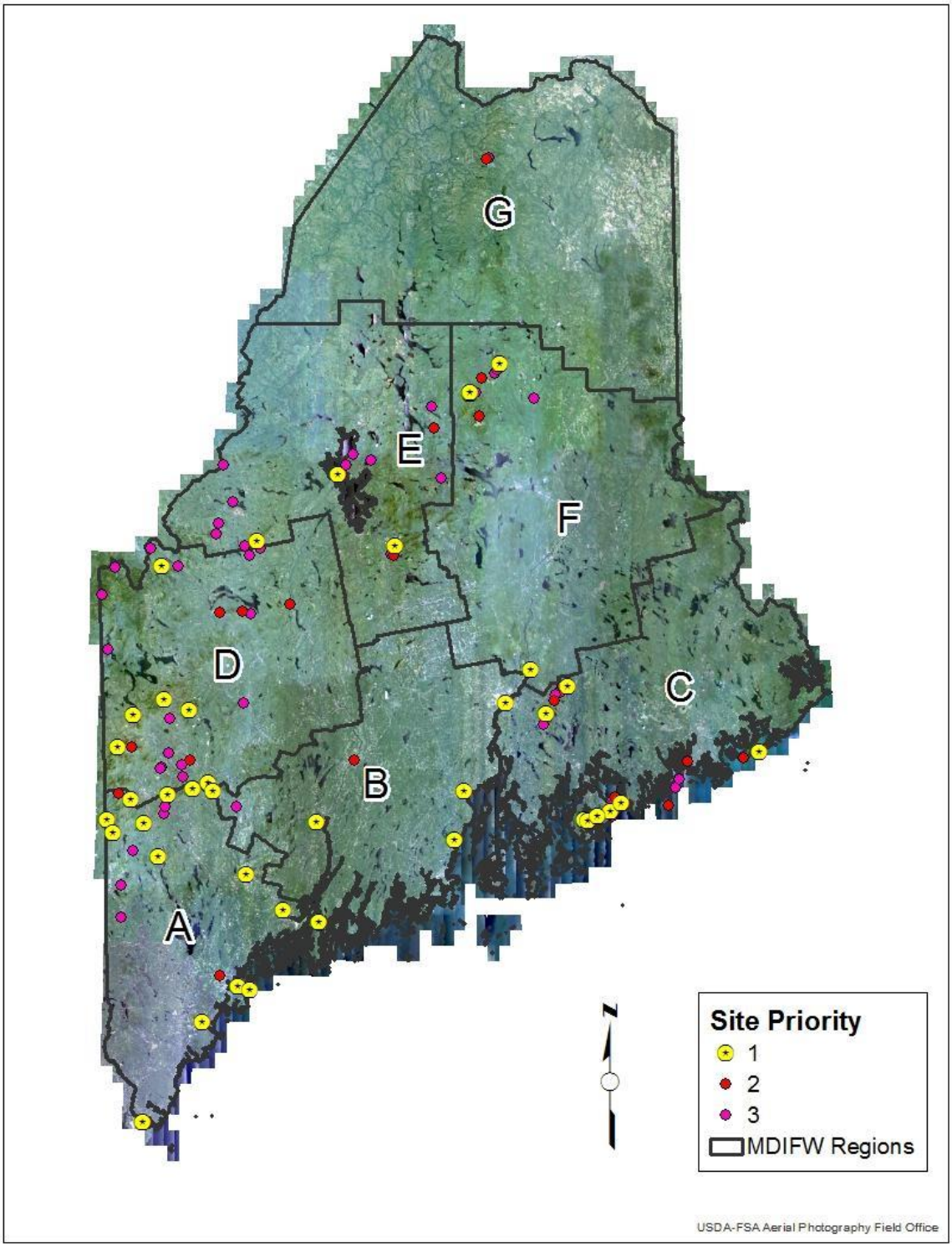
Survey timing - Timing of initial surveys at eyries varied depending on accessibility but generally occurred between mid-March through May and continued through July. In northern New England, peregrine falcons generally occupy breeding sites and initiate courtship and territorial defense behaviors beginning in early March, although these behaviors are often delayed in inexperienced birds into April and early May. The optimal time of year to conduct surveys to detect presence at breeding sites is from late March through late April when pairs are in courtship and before secretive incubation behavior begins. Variation in timing occurs, however in general the following timeframes apply:

Territory occupancy/courtship: Mar 15-Apr 15
Incubation: Apr 15-May 15, *low visibility/detection*
Hatch: May 15-Jun 15, *high detection but failed nesting attempts can easily be missed*
Fledging: Jun 15-Jul 15, *high detection but difficult to confirm occupancy at inactive/failed sites*

Call-broadcast - Observers had the option of broadcasting a peregrine call (i.e. call-broadcast) using a speaker, as this has been found to shorten the time necessary to detect breeding pairs (Barnes et al. 2012). The call-broadcast approach was found to be equally effective throughout the day and most effective earlier in the breeding season (Barnes et al. 2012). Success of call-broadcast in soliciting a territorial peregrine response has been documented between 0.7 and over 1.5 km from the eyrie (Ambrose et al. 2014 and Barnes et al. 2012 respectively).

Data collection and submission - Data was collected using a standard survey form during each visit and an eyrie record form, which described the physical site characteristics, was completed once per season. Data could be submitted either by email or observers had an option to enter their data via an online software program called NestStory. This latter option facilitated consistent data collection and reporting, real-time information sharing, and thus significantly optimized efficiency and survey effort.

Figure 1. Distribution of peregrine falcon survey sites categorized by sampling priority. Priority 1 locations are historical nesting sites where breeding activity has been documented since 1987. Priority 2 and 3 locations have pre-1961 breeding activity or post-1987 resident peregrine observations that may serve as nest sites or are historic Golden Eagle (*Aquila chrysaetos*) sites and serve as potential peregrine nesting habitat.



Nesting Season Summary

Photo by Trish Berube

Survey results – The 2021 Maine peregrine falcon population consisted of 41 known pairs, with 31 breeding pairs documented (evidence indicates that eggs were laid, incubation, or young were produced), four territories occupied by a single adult, and a subadult female was present in three pairs (Table 1). Of the 31 pairs that attempted to nest, 27 pairs were successful and hatched 58 chicks and produced 50 fledglings (~ > 28 days old), with 34 young observed at the flight stage (fledged). The overall productivity rate was 1.22 fledglings per occupied territory (50 fledglings/41 occupied territories). An occupied territory is where either a pair is present or there is evidence of reproduction (e.g. adult incubating, eggs, young, food delivered to nest [USFWS 2003]).

Most pairs were present on cliffs (56%), but also present on buildings (including transmission towers, cell towers, light structures, and lighthouses, 20%), quarries (12%), bridges (7%), and previously used osprey nests (5%). The first reported pair was observed on March 3 by Chris Martin at their nest site at the Piscataqua River Bridge in Kittery ME/Portsmouth N.H.

Priority sites - Of the 57 priority 1 sites (high sampling priority due to recent breeding history or presence of a single or pair), 55 were monitored in 2021 (96%). Two priority 1 sites were not surveyed: Gardner Mtn (11B) and Lord Mtn (48). Of the priority 1 sites, 41 (72%) were occupied territories and 11 (19%) were monitored (varying durations) and suspected to be unoccupied.

Survey effort - With the momentum of the last two years of statewide surveys, 2021 was again an impressive overall effort. A total of 359 surveys were conducted, with 603 hours logged, and 82 sites visited between March 3 and September 22.

Field technician contribution - A full time seasonal peregrine surveyor, Evan Jackson, was hired in 2021 and made significant contributions to the annual effort. This position allows us to

document peregrine activity in more remote areas where it is challenging to recruit volunteers. Evan conducted 68 surveys, logged 256 survey hours, 11,763 miles, and visited 29 sites between 3/19 and 8/11. He identified 7 pairs (sites 16, 30, 31, 46, 55, 64, and 82, [see Table 1 for site names]), 2 sites with single peregrines (sites 1 and 38), 9 chicks, 5 fledglings, and 4 young in flight.

Weather conditions and climate change – April experienced significantly above normal temperatures, with near normal rain and snowfall. Maine's meteorological summer – June, July, and August – in 2021 was one of the four hottest ever recorded in Maine. The past two summers were about 3 degrees warmer than the average summer has been since the late 1800s, according to the Maine Climate Office. These effects are already visible in Maine, where winters are now about two weeks shorter than they were a century ago and ocean waters are some of the fastest-warming on the planet (Ropeik 2021). This summer also saw huge swings in precipitation. July – which was unusually cool, unlike the rest of the season – was the wettest on record in Augusta and second wettest in Portland and contained about three-quarters of the summer's rainfall, most in tropical storms. These extreme weather conditions can result in nest failure and/or re-nesting attempts. Placement of nest boxes for urban nesting pairs can help provide shelter for their eggs and young from extreme temperature fluctuations and large storm events that they may not have otherwise (Anctil et al. 2014, Sumasgutner et al. 2020).

Table 1. Site-specific results of peregrine falcon monitoring in Maine, 2021.

Site #	Site Name	IFW Region	Priority	Site Status	# Chicks	First Survey Date	Last Survey Date	Total effort (min)	# Surveys
1	Bigelow Mtn	D	1	Single		5/28	6/24	480	2
2	C Bluff Mtn	D	1	Pair	1	6/17	6/17	60	1
3	Lightning Ledge	D	2	None		5/24	6/18	480	2
5	Ripogenus Dam	E	2	None		5/19	6/9	480	2
6	Mt Kineo	E	1	Single		5/24	7/7	720	4
7	Wassataquoik Mtn	F	1	Pair		6/16	7/3	240	2
9	Horse Mtn	F	1	Pair		4/8	7/22	990	5
12	Pine Mtn	A	1	Pair	2	3/21	7/10	430	6
13	Buck's Ledge	A	1	None		3/19	4/18	480	2
14	Tumbledown Dick Mtn Gilead	D	2	None		4/2	5/8	480	2
15	Rumford Mill	D	1	None		3/27	4/24	480	2
16	Bald Mtn	A	1	Pair	1	4/4	6/17	825	5
17	Mt Megunticook	B	1	Pair	1	3/27	8/6	225	4
18	Eagle Bluff	C	1	Pair	4	5/7	7/5	205	5
19	Fletcher Bluff	C	1	Pair		4/8	9/8	390	7
20	Half Mile Pond	C	1	None		3/20	6/10	400	4
21	Eagle Bluff	C	2	None		6/11	6/11	110	1
22	The Precipice	C	1	Pair	2	3/12	8/3	1264	13

Table 1 continued. Site-specific results of peregrine falcon monitoring in Maine, 2021.

Site #	Site Name	IFW Region	Priority	Site Status	# Chicks	First Survey Date	Last Survey Date	Total effort (min)	# Surveys
24	Beech Cliff	C	1	None		3/30	6/21	184	2
25	Valley Cove	C	1	Pair	2	3/17	8/3	2160	13
27	Jordan's Delight	C	1	Pair	1	3/23	5/28	10	2
29	The Brothers	C	1	Single		5/7	5/7	86	1
30	Grafton Notch	D	1	Pair		3/20	6/15	720	3
31	Tumbledown Mtn	D	1	Pair		5/14	7/7	720	3
32	Henhawk Ledge	D	2	None		4/3	5/1	480	2
35	East Royce Mtn	A	1	Pair	3	4/5	7/10	998	10
38	Tumbledown Dick Mtn Peru	D	1	Single		4/27	8/4	1232	6
39	Shutdown Mtn	E	1	None		4/20	8/6	960	6
41	Rattlesnake Mtn	A	1	None		5/13	6/1	480	2
42	Ragged Jack Mtn	D	1	None		4/7	8/7	625	4
43	Barren Mtn	E	1	Pair	1	3/30	7/8	610	5
44	Jordan Pond	C	1	Pair	2	4/9	7/28	677	10
45	Squaredock Mtn	A	1	Pair	3	3/27	7/6	275	5
46	Brimstone Mtn	D	1	Pair	1	4/23	7/26	1050	5
47	Bigelow Mtn - Cranberry Peak	D	2	None		6/16	7/12	480	2
49	Ironbound Island	C	1	Pair		4/15	6/9	109	2
50	Big Libby Island	C	1	None		5/20	5/20	240	1
51	Bath Iron Works	A	1	Pair	3	3/27	7/13	521	9
52	Casco Bay Bridge	A	1	Pair		4/6	5/17	180	3
53	Piscataqua River Bridge (I-95)	A	1	Pair	nest failure	3/3	7/22	735	8
55	Bear Mtn Waterford	A	1	Pair	2	3/20	7/19	1080	6
56	Pejepscot Quarry	A	1	Pair	2	3/24	8/11	827	13
57A	Franco Center/Cont Mill	A	1	Pair	4	3/21	9/22	1080	19
58A	Sappi Paper Mill Westbrook	A	1	None		4/22	4/22	15	1
58B	Westbrook Quarry	A	1	Pair	4	4/22	7/8	765	14
59A	Granite Hill Quarry	B	1	Pair	2	4/7	6/8	510	4
60	395 Bridge	C & B	1	Pair*		3/22	6/9	101	6
61	Old Town Mill	F	1	Pair		3/16	6/9	493	9
62	Old Scott Paper Mill	B	1	Pair*	nest failure	3/17	9/20	993	13
63A	Passag Bridge	B	2	None		4/13	4/13	5	1

*Sites 60 & 62, subadult females

Table 1 continued. Site-specific results of peregrine falcon monitoring in Maine, 2021.

Site #	Site Name	IFW Region	Priority	Site Status	# Chicks	First Survey Date	Last Survey Date	Total effort (min)	# Surveys
63B	Belfast Quarry	B	1	Pair*		3/17	6/7	416	16
64	Indian Str. Mtn	D	1	Pair	3	6/18	7/14	210	2
65	Ram Isl Ledge Lighthouse	A	1	Pair	1	6/18	6/18	30	1
66	MERC Inciner.	A	1	Pair	2	6/18	6/28	225	2
066B	Saint Andres	A	1	None		3/25	7/12	647	10
67	Trans. tower	B	1	Pair	2	3/21	6/9	385	7
69	Dragon Fields Quarry	A	1	Pair	nest failure	4/22	6/28	532	13
73	Mosquito Mtn	B	2	None		3/23	3/23	30	1
76	Little Bear Mtn	A	2	None		4/2	5/8	480	2
77	Ledge Ridge	D	2	None		5/7	5/13	150	2
82	Fourth Debsconeag Lake	E	1	Pair	2	7/10	7/10	120	1
86	Sappi Mill Skowhegan	D	1	Pair	nest failure	3/17	8/4	220	7
89	Sisk Mtn	D	3	None		7/28	7/28	240	1
93	Stone Mtn	A	3	None		7/29	7/29	240	1
97	Mt Dimmock	D	3	None		4/10	5/15	480	2
99	Bear Mtn Hartford	B	3	None		5/16	5/16	30	1
100	Sabattus Mtn	A	3	None		6/30	7/19	480	2
109	Little Peaked Mtn	C	3	None		6/10	6/10	60	1
110	Peaked Mtn	C	3	None		6/10	6/10	60	1

*Site 63B, subadult female

Site 86, photo by Erynn Call

Table 1 continued. Site-specific results of peregrine falcon monitoring in Maine, 2021.

Site #	Site Name	IFW Region	Priority	Site Status	# Chicks	First Survey Date	Last Survey Date	Total effort (min)	# Surveys
112	Borestone Mtn	E	3	None		4/27	4/29	330	2
113	Little Kineo Mtn	E	3	None		6/3	7/22	300	4
117	Soubunge Mtn	E	3	None		6/29	7/24	480	2
122	Granny's Cap	D	3	None		6/26	7/15	480	2
123	Heald Mtn	D	3	None		7/27	7/27	240	1
124	Slidedown Mtn	E	3	Pair	1	7/13	7/20	75	2
129	Little Bigelow Mtn	D	3	None		7/20	8/11	480	2
130	Dragon Cement	B	1	Pair	3	5/18	6/4	65	2
131	Deer Isle Bridge	C	2	None		3/23	3/23	75	1
132	Lincoln Mill	F	1	None		3/25	3/25	80	1
133	Riverside Scrap	D	3	None		5/16	5/16	150	1
135	Mansell Mtn	C	3	None		3/30	3/30	49	1
136	Madison Mill	D	1	Pair	3	4/5	7/30	180	6

Photo by Oana Zamfirescu/Avian Haven

Banding **-** When possible, adult, or young peregrines are fitted with a United States Geological Survey (USGS) leg band etched with a unique nine-digit number and a bi-colored band with a unique series of colors, letters, and numbers. In the Northeast, peregrines are banded with the colors black over green.

In 2021, no adult peregrines were banded and five hatch year (HY) birds were banded at two nest locations by MDIFW with partners Rich Burton (Animal Damage Control agent and experienced urban climber), Marek Plater (raptor bander and retired falconer), Chinburg Properties, and TimberHP by GO Lab (Table 2). Three HY birds were treated, banded, and released by Avian Haven, one HY bird was treated by Avian Haven and transferred to Center for Wildlife as an ambassador, and one HY bird was trapped and relocated from the Portland Jetport by USDA Wildlife Services.

Table 2. 2021 Maine peregrine banding summary.

Date Encountered	Status	Encounter Town	Age	Sex	Color Band	Contact/Partner
5/27	Banded at nest	Madison	HY	F	C/H	TimberHP by GO Lab
5/28	Banded at nest	Lewiston	HY	M	BP/05	Chinburg Properties
5/28	Banded at nest	Lewiston	HY	F	C/K	Chinburg Properties
5/28	Banded at nest	Lewiston	HY	F	C/M	Chinburg Properties
5/28	Banded at nest	Lewiston	HY	F	C/N	Chinburg Properties
8/6	Injury/released	Camden	HY	F	C/V	Avian Haven
8/22	Injury/released	Sidney	HY	F	C/U	Avian Haven
9/12	Injury/released	Alfred	HY	M	B/P	Avian Haven
10/6	Trapped	Portland	HY	F	99/U	USDA Wildlife Services
10/7	Injury/no release	Brunswick	HY	M	None*	Avian Haven

*Transferred to Center for Wildlife as an ambassador on 11/2.

Band resighting **-** Resighting of leg bands is often accomplished using a spotting scope and photographs, but information can also be collected if a bird is found injured or a carcass is collected. These resightings allow biologists to distinguish individuals and to verify the origins and history of the falcon.

On March 17th, Trish Berube spotted the resident adult, 3-year-old female (2206-71771, 49/U) in Lewiston. She was originally banded at Valley Cove in Acadia National Park on 5/31/18. You can learn more about her here and here.

Photo by Trish Berube

On May 28th, Trish spotted another banded adult, 14-year-old male (1807-96622, C/B) in Pejepscot. He was originally banded at the Casco Bay Bridge on 6/4/07.

On August 6th, a silver leg band was recovered via metal detecting in Dixfield. This band was placed on a female 23 years ago in Bartlett, N.H.!

A few peregrines were encountered with bands but unfortunately not able to be identified. A falconer trapped a HY peregrine in Scarborough with a silver band on one leg and green over black color band on the other but was unable to read it as it was released immediately with mud covering the bands. Two other peregrines were observed with bands in Madison and Brewer, the former confirmed with only a silver band and the latter with a silver and color band. Hopefully we might have a chance at reading the color band in Brewer in 2022.

Mortality – A single mortality was confirmed this year of a HY bird on Ironbound Island in Winter Harbor. It likely collided with a window/building while hunting as it was found near a boat house.

Nest structures – In 2021 MDIFW consulted and collaborated with partners leading to the placement of five nest boxes and two nest trays at locations where pairs were already present. Artificial nest structures greatly improve urban nesting success by providing a safe place for peregrines to lay their eggs and raise their young. Urban peregrines often lay eggs on cement or other hard surfaces which become too hot, cold, or wet. Nest boxes or trays contain a layer of gravel, mimicking the natural cliff habitat where temperature and moisture are better regulated to improve hatching success. These structures are also helping urban peregrines cope with extreme temperature and storm events associated with climate change, provide better accessibility for banding, and allow us to select the best location for nesting to minimize disturbance to the birds from people and also from the defensive parents to people. Nest aids can be placed on buildings, bridges, or other structures. Peregrines are helpful in that they keep avian pests (pigeons, starlings, gulls) and their droppings at bay.

The Maine Department of Transportation (MDOT) and MDIFW continue to collaborate on peregrine nest structures. At the Casco Bay Bridge in 2021, biologist Justin Sweitzer relocated an unused nest box, as well as built, and installed a new nest tray. These structures were placed to position the birds in a location where they would not be disturbed by staff, provide shelter from extreme weather, and allow access for banding young. After a second year of nest failure (eggs laid directly on metal) at the Piscataqua River Bridge/I-95 in Kittery ME/Portsmouth NH , MDIFW, MDOT, and NH Audubon worked together to place a nest tray nearby in hopes the birds would move and achieve success in the future.

Photos by Erynn Call

A nest box installed at the Continental Mill in 2006, that did not have prior documented success, was discovered to be used by the local pair this year and fledged four young (see game camera photos on page 23). MDIFW worked closely with the very supportive site owners, Chinburg Properties, and onsite manager John Fanning. We decided to remove the nest box once the young fledged as the site will be extensively renovated soon. Fortunately, Chinburg owns the adjacent Hill Mill and with the help of Chinburg staff and volunteer carpenter, Kurt Woltersdorf, a beautiful nest box was positioned on the rooftop.

Photo by Erynn Call

Photo by Paul Roy

In Winslow, last year the local pair nested along the Kennebec River on a ledge just a few meters above the water. While successful, this location is precarious due to rising waters that can occur during weather events or spring thaw. This makes it challenging for young to fledge safely. In 2021, nest failure was confirmed in a fan vent above the ledge. The property owners, Kennebec River Development Park (KRDP), were eager to help in any way they could. With a site visit, KRDP Team Leader Paul Roy and MDIFW were able to select a safe location nearby where the birds would experience safer fledging conditions, limited disturbance from staff, safety from raccoons that are known to frequent the rooftops, and provide access for banding the young. This nest box also provides a unique opportunity for public viewing from RiverWalk at Head of Falls in Waterville.

The first ever confirmed nest at Sappi Somerset Mill in Skowhegan unfortunately ended in failure this year. We suspect the nest was swept away after a large rainstorm as it was situated at the bottom edge of a cone-shaped roof. The pair continued to be observed after the failure, hunting and enjoying gull and pigeon meals on their territory. Staff were excited about the opportunity to help this rare raptor find a safer nest location. After a consultation visit with MDIFW where a suitable site was selected, Sappi carpenters built and installed an impressive nest box. The new box overlooks the failed nest site nearby. The box provides a safe location in storm events and is better positioned to avoid disturbance from

Photo by Erynn Call

staff than the prior nest location. Banding access for the young will also be safe and easy, in contrast to the original site that did not provide this option.

Photo by Erynn Call

A new pair was discovered nesting in a fan vent at the TimberHP by GO Lab property overlooking the Kennebec River in Madison last year. The nest area was very small, didn't provide much space for the young to exercise their wings, and was directly over the river. There was no room for error as the young fledged. GO Lab was welcoming and helped locate a rooftop nearby for a nest box. This particular project involved a wonderful mix of partners, including assistance from GO Lab staff Ralph Tranten, funding for the box and cellular game camera courtesy of the Maine Falconry and Raptor Conservancy, carpentry expertise of Brian Ashe, and installation assistance from Evan Jackson and MDOT biologist Justin Sweitzer. The prior year's nest site was blocked off in hopes of encouraging the pair to use the box. We found that the pair has a strong affinity for fan vents when they selected yet another one directly adjacent to the nest box this year. This year's fan vent was quite limited in space yet again but was somewhat accessible and one of the three chicks was banded safely.

A pair that frequented the ND Paper Old Town Mill over the years and only once was documented with fledglings, hopefully will soon discover the new box that was built and installed by staff. While the extensive landscape of rooftops wasn't secure enough to attempt to pinpoint any potential failed nests this year, a site was selected on the side of one of the buildings where the pair are often seen to perch. The box faces the open expanse of the Penobscot River, provides an area of low disturbance from people and easy access for banding the young. ND Paper is very excited about the opportunity to benefit the pair and has high hopes they will take to the box. Their outreach department is poised to share this story to the local community and beyond.

Photo by ND Paper

In addition to placing nest structures, a history of peregrine nest structures in Maine was assembled in 2021 (Table 3).

Table 3. Peregrine falcon nest structures in Maine, 2004 – 2021.

Site #	IFW Region	Site Name	Town	Structure Type	Year install	Year removed
NA	B	Waldo-Hancock Bridge	Bucksport/Prospect	tray	2004	2013
57C	A	Continental Mill	Lewiston	box	2006	2021
53	A	Piscataqua Riv Bridge/I-95	Kittery/Portsmouth	tray&box	2007	2018
52	A	Casco Bay Bridge	Portland/S. Po.	tray	2007	2021
52	A	Casco Bay Bridge	Portland/S. Po.	box	2021	NA
52	A	Casco Bay Bridge	Portland/S. Po.	tray	2021	NA
53	A	Piscataqua Riv Bridge/I-95	Kittery/Portsmouth	box	2019	NA
53	A	Piscataqua Riv Bridge/I-95	Kittery/Portsmouth	tray	2021	NA
60	C&B	395 Bridge	Bangor/Brewer	tray	2016	NA
63B	B	Belfast quarry	Belfast	box	2019	NA
63A	B	Passagassawakeag Bridge	Belfast	tray	2019	NA
136	D	Madison Mill	Madison	box	2021	NA
86	D	Sappi Mill Skowhegan	Skowhegan	box	2021	NA
62	B	Old Scott Mill	Winslow	box	2021	NA
61	F	Old Town Mill	Old Town	box	2021	NA
57D	A	Hill Mill	Lewiston	box	2021	NA

Photo by Lauren McPherson

Conservation Actions

MDIFW works toward promoting a self-sustaining peregrine falcon population to restore its ecological role and enable the public to enjoy this charismatic species within Maine and beyond our borders. In considering the 27 successfully nesting pairs in Maine this year (i.e. produced at least one chick), we must also assure that peregrines are able to replace themselves by producing a minimum number of young (i.e. sustainable productivity). We have made great progress and will continue to follow initiatives that are made possible through many successful collaborations and partnerships with Federal, State, private and dedicated individuals.

Maine peregrine conservation plan – A draft plan was submitted for internal Department review in the fall of 2021. The document outlines many of the aspects of species conservation listed below and should be available for public review and completion in 2022.

State species listing status – Background information and proposed criteria were submitted as part of the species conservation plan. The state endangered and threatened species list is reviewed every eight years and is set for review in 2022. The breeding population of peregrines (separate from Tundra subspecies that migrates through in the spring and fall) is currently listed as state endangered.

Peregrine monitoring –

> ***Statewide surveys*** – Completed three consecutive years (2019 – 2021) following a standardized survey protocol (Call 2021) and use of NestStory. Propose (as part of conservation plan currently in review) to pause statewide surveys for five years and complete another three consecutive years in 2027 – 2029.
>
> ***Annual surveys*** – Propose annual surveys at sites where there is a management need or locations that have interested community surveyors/partners, as well as investigate reports of new pairs. Management sites may include cliff locations where disturbance needs to be monitored and mitigated (e.g. trail closures or reroutes due to hiking and/or climbing activity) or urban locations that experience various types of disturbance (e.g. development, maintenance, construction etc.).
>
> ***Banding*** – Adults and young are banded when logistically possible and safely accessible. Resighting or recovery of bands contribute to the Atlantic Flyway dataset and understanding of metapopulation dynamics, survival, movement, dispersal, distribution, ancestry, and adaptability to changing environments. Information on these metrics in Maine are limited and are relevant to species conservation. Banding provides opportunities for contaminant sampling and sharing the story of peregrine falcons in their diverse and contrasting habitats in Maine.

Photo by Trish Berube

Photo by Erynn Call

Site management –

Cliff – This may include maintaining and building partnerships and collaborations with various state and federal agencies, nonprofits, landowners, and private industry and individuals at cliff nesting sites. Coordinate monitoring and work toward mitigating and addressing disturbances through consideration of closing or rerouting trails, participating or providing feedback on conservation planning, environmental review, development and effective placement of trails signs and other outreach material to connect with outdoor enthusiasts such as the hiking and climbing communities.

Urban – Similarly to cliff sites, urban locations also require diverse partnerships to address management needs. This will involve coordinating monitoring, developing creative solutions to mitigate disturbances at a variety of urban nesting locations such as adjusting timing of maintenance and construction activities. Installation of nest boxes will also occur at sites where the existing local pair may benefit from safer and better nest conditions. This includes better temperature and moisture conditions for eggs and young due to the gravel substrate in the box, better shelter to cope with extreme temperature and storm events associated with climate change, and limited disturbance from people or even mammals such as raccoons. Boxes have the added benefit of providing easy access to young for banding, contaminant sampling, and outreach opportunities.

Data management –

Breeding data – Partnership with The Little Egg Foundation and use of NestStory resulted in effective and efficient data collection. We hope to consolidate post-recovery (e.g. 1985 to present) Maine peregrine monitoring data that was collected and archived by MDIFW and Acadia National Park. Currently data are in multiple formats (e.g. Microsoft Access, Excel, Outlook, individual scanned survey forms, paper forms). Develop a standard database/data fields for application into the future.

Reporting – Provide peregrine breeding data as part of annual reporting (e.g. Pittman Robertson) and Department data collection (e.g. Endangered, Threatened, and Special Concern database (ETSC), Maine Bird Atlas).

Contaminants – Despite the ban on the pesticide DDT in 1972, which led to the peregrine resurgence, there is still a chemical cocktail of contaminants that are persistent in the environment – which means they don't break down and can accumulate over time. Biomonitoring using raptors as sentinels can provide an early warning of the potential impacts of contaminants on humans and the environment (Gomez-Ramirez et al. 2014). As top-level predators' peregrines are poised to be ideal indicators of exposure (Sun et al. 2020, Vorkamp et al. 2019). Gaining insight into the presence of these chemicals not only has implications for peregrine populations but also as long-lived apex predators; predatory birds represent a sentinel species for human health (Heys et al. 2017). Of relevance is the discovery of perfluoroalkyl substances (PFAS) in certain areas in Maine and questions surrounding the extent of these impacts within the region. PFAS are found in food packaging, household cleaners, stain- and water-repellent fabrics, and nonstick cookware. For peregrines, population-level effects from contaminants are likely to take place over a relatively long-rather than short-term (USFWS 2003). Environmental contaminants can be examined through analysis sampling of blood, feathers of adult and young as well as unhatched eggs. Little is known about contaminant exposure in Maine peregrines. Although the threat to peregrines from some contaminants have been controlled, contaminants will continue to be a concern (Fernie et al. 2017, Falk et al. 2018, Shore and Taggart 2019) and will be the most likely future threat to peregrine populations. We hope to further investigate and consider opportunities to sample contaminants in Maine breeding peregrines.

Outreach - The ability of peregrines to spark the imagination and interest in a broad spectrum of people, whether a carpenter, birder, or falconer is a testimony to this raptor's unique connection to humans. Management actions, including breeding surveys, banding young, placing, and monitoring nest boxes, should be valued, and prioritized not only for species conservation value but also for fostering community connections to and awareness of wildlife and MDIFW's mission. We will continue to seek out opportunities to share the story of peregrine conservation to a wide audience. Banding of young this year was shared in a MDIFW blog and an Instagram post. Check out the Acknowledgment section of this report to see everyone MDIFW connected with as part of the peregrine conservation this year.

What you can do to help Maine peregrines –

- Contact the MDIFW Peregrine Program coordinator, Erynn Call, to get involved with standardized surveys, if you have carpentry or other relevant experience that may be helpful in constructing and placing nest structures (erynn.call@maine.gov).
- Consider donating to The Little Egg Foundation, Chickadee Check-off, or Maine Birder Band to support peregrine conservation in Maine.
- Please report observations of peregrine falcons at Maine eBird or consider getting involved in the Maine Bird Atlas (note this effort ends in 2022).
- Know what to do if you find an injured peregrine falcon (Appendix 1).
- Share this report with friends and family!

Literature Cited

Ambrose, Skip, et al. 2014. Use of and responses to audio survey technique by Peregrine Falcons in Alaska. Northwestern Naturalist: A Journal of Vertebrate Biology, 95(2), p. 125+.

Anctil, A., Franke, A. and Bêty, J., 2014. Heavy rainfall increases nestling mortality of an arctic top predator: experimental evidence and long-term trend in peregrine falcons. Oecologia, 174(3), pp.1033-1043.

Barnes, J.G., Jaeger, J.R. and Thompson, D.B., 2012. Effectiveness of call-broadcast surveys to detect territorial Peregrine Falcons. Journal of Raptor Research, 46(4), pp.365-377.

Call, E. 2021. 2021 Maine peregrine falcon monitoring protocol. MDIFW, 27 pp.

Enderson, J. H., W. Heinrich, L. Kiff, AND C. M. White. 1995. Population changes in North American Peregrines. Trans. North Am. Fish and Wildl. Conf. 60:142-161.

Faccio, S.D., Amaral, M., Martin, C.J., Lloyd, J.D., French, T.W. and Tur, A., 2013. Movement patterns, natal dispersal, and survival of peregrine falcons banded in New England. Journal of Raptor Research, 47(3), pp.246-261.

Falk, K., Møller, S., Rigét, F.F., Sørensen, P.B. and Vorkamp, K., 2018. Raptors are still affected by environmental pollutants: Greenlandic Peregrines will not have normal eggshell thickness until 2034. *Ornis Hungarica*, *26*(2), pp.171-176.

Fernie, K.J., Chabot, D., Champoux, L., Brimble, S., Alaee, M., Marteinson, S., Chen, D., Palace, V., Bird, D.M. and Letcher, R.J., 2017. Spatiotemporal patterns and relationships among the diet, biochemistry, and exposure to flame retardants in an apex avian predator, the peregrine falcon. Environmental research, 158, pp.43-53.

Gomez-Ramirez, P., Shore, R.F., Van Den Brink, N.W., Van Hattum, B., Bustnes, J.O., Duke, G., Fritsch, C., García-Fernández, A.J., Helander, B.O., Jaspers, V. and Krone, O., 2014. An overview of existing raptor contaminant monitoring activities in Europe. Environment International, 67, pp.12-21.

Green, M.T., 2003. Monitoring Plan for the American Peregrine Falcon: A Species Recovered Under the Endangered Species Act. US Fish & Wildlife Service, Migratory Birds & Habitat Programs.

Grier, J.W. AND J.H. Barclay. 1988. Dynamics of founder populations established by reintroduction. Pages 689–700 in T.J. Cade, J.H. Enderson, C.G. Thelander, and C.M. White [EDS.], Peregrine Falcon populations: their management and recovery. The Peregrine Fnd, Inc., Boise, ID U.S.A.

Heys, K.A., Shore, R.F., Pereira, M.G. and Martin, F.L., 2017. Levels of organochlorine pesticides are associated with amyloid aggregation in apex avian brains. Environmental science & technology, 51(15), pp.8672-8681.

Ropeik, A, 2021. Summer 2021 brings climate change trends home in Maine; more humidity, heat and rain. Retrieved from https://spectrumlocalnews.com/me/maine/news/2021/09/16/summer-2021-showed-climate-change-impacts-in-maine

Shore, R.F. and Taggart, M.A., 2019. Population level impacts of chemical contaminants on apex avian species. Current Opinion in Environmental Science & Health.

Sumasgutner, P., Jenkins, A., Amar, A. and Altwegg, R., 2020. Nest boxes buffer the effects of climate on breeding performance in an African urban raptor. Plos one, 15(6), p.e0234503.

Sun, J., Letcher, R.J., Eens, M., Covaci, A. and Fernie, K.J., 2020. Perfluoroalkyl acids and sulfonamides and dietary, biological and ecological associations in peregrine falcons from the Laurentian Great Lakes Basin, Canada. Environmental Research, 191, p.110151.

U.S. Fish and Wildlife Service, 1999. Endangered and threatened wildlife and plants; final rule to remove the American Peregrine Falcon from the Federal list of endangered and threatened wildlife, and to remove the similarity of appearance provision for free-flying peregrines in the conterminous United States. U.S. DOI., U.S. Fish and Wildlife Service. Federal Register 64: 46542-46558.

US Fish and Wildlife Service, 2003. Monitoring plan for the American Peregrine Falcon, a species recovered under the Endangered Species Act. U.S. Fish and Wildlife Service, Divisions of Endangered Species and Migratory birds and State Programs, Pacific Region, Portland, OR. 53 pp.

Vorkamp, K., Falk, K., Møller, S., Bossi, R., Rigét, F.F. and Sørensen, P.B., 2019. Perfluoroalkyl substances (PFASs) and polychlorinated naphthalenes (PCNs) add to the chemical cocktail in peregrine falcon eggs. Science of the total environment, 648, pp.894-901.

Wootton, J.T. and D.A. Bell. 1992. A metapopulation model of the Peregrine Falcon in California: viability and management strategies. Ecological Applications 2: 307–321.

Site 57A, photos by game cameras

Appendix 1. What to do if you find an injured peregrine falcon (contact MDIFW for .pdf).

WHAT TO DO IF YOU FIND AN INJURED PEREGRINE FALCON

Urban peregrine falcons can get injured through collision with buildings, wires, or vehicles. During the summer in Maine, fledgling peregrines often find themselves on the ground when learning how to fly. If you find a peregrine falcon, please follow the guidelines below:

1. When recovering the bird, wear gloves and be careful of sharp talons and beak. Place it in a cardboard box with padding on the bottom, like an old towel. The box should be ventilated and set in a quiet, temperature-controlled area. Do not provide food or water.

2. Contact the following:
    - Between 8:30 am – 5:30 pm, Mon - Sun, Avian Haven, 207.382.6761. Leave a message after hours and then call the appropriate number listed below.

    - Between 5:30 pm – 8:30 am, closest MDIFW Warden Service Dispatch Center:
        - Gray Dispatch: 1.800.228.0857
        - Augusta Dispatch: 1.800.452.4664
        - Bangor Dispatch: 1.800.432.7381


3 weeks


Fledgling


Adult