

SUPPLEMENTAL MATERIALS

AN IMPROVED MECHANICAL OWL FOR EFFICIENT CAPTURE OF NESTING

RAPTORS

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Supplementary Table 1. Suggested hardware and materials for assembly of mechanical lure owl.

ITEM	PURPOSE
Radio Transmitter (3-channel)	Sends control signals from operator to system
Radio Receiver (3-channel)	Receives control signals and distributes to servo actuators
2-3 Standard Servos	Servomotor actuators, for each independent motion
Switch	Power toggle for system
Battery	Rechargeable system battery (can substitute 4x AA battery holder)
Pushrods (4-40 thread 12" w/ clevis)	Transmits movement from wing drive servo to wings
Pushrod-Wing Connectors (large nylon control horns)	Connects Pushrod to Wing
Pushrod-Servo Screw-lock Connector	Connects servo to wing pushrod
8 Magnets (1/4" diameter, 1/16" thick)	Removable connection between head and actuation servo
5-minute Epoxy	High-strength adhesive for permanent connections
Waterproof Silicone Adhesive	Long-term removable bonds - servo mounting
Microfiber Adhesive Filler	Fiberglass filler to thicken and strengthen epoxy
Aluminum Sheet (1/16" thick)	Body-side wing mounts
Threaded Rod (8-32)	Wing-side wing mounts
Nuts & Washers (8-32)	Body-wing fastening

Supplementary Table 2. Minimum tool list necessary for assembly of mechanical owl.

TYPE	ITEM
Hand Tools	Hobby knife
	Snap-blade razor knife
	Pliers
	Screwdriver
Power Tools	Cordless drill and bits
	Scroll saw w/ metal and wood blades
	Rotary tool with cutoff wheels and sanding discs
Other Supplies	Small mixing cups and sticks
Safety Equipment	Nitrile gloves
	Paper face mask
	Safety glasses

Supplemental Table 3. Time to capture raw data from trapping attempts on Northern Goshawks in NY and PA during the 2005 – 2017 breeding seasons.

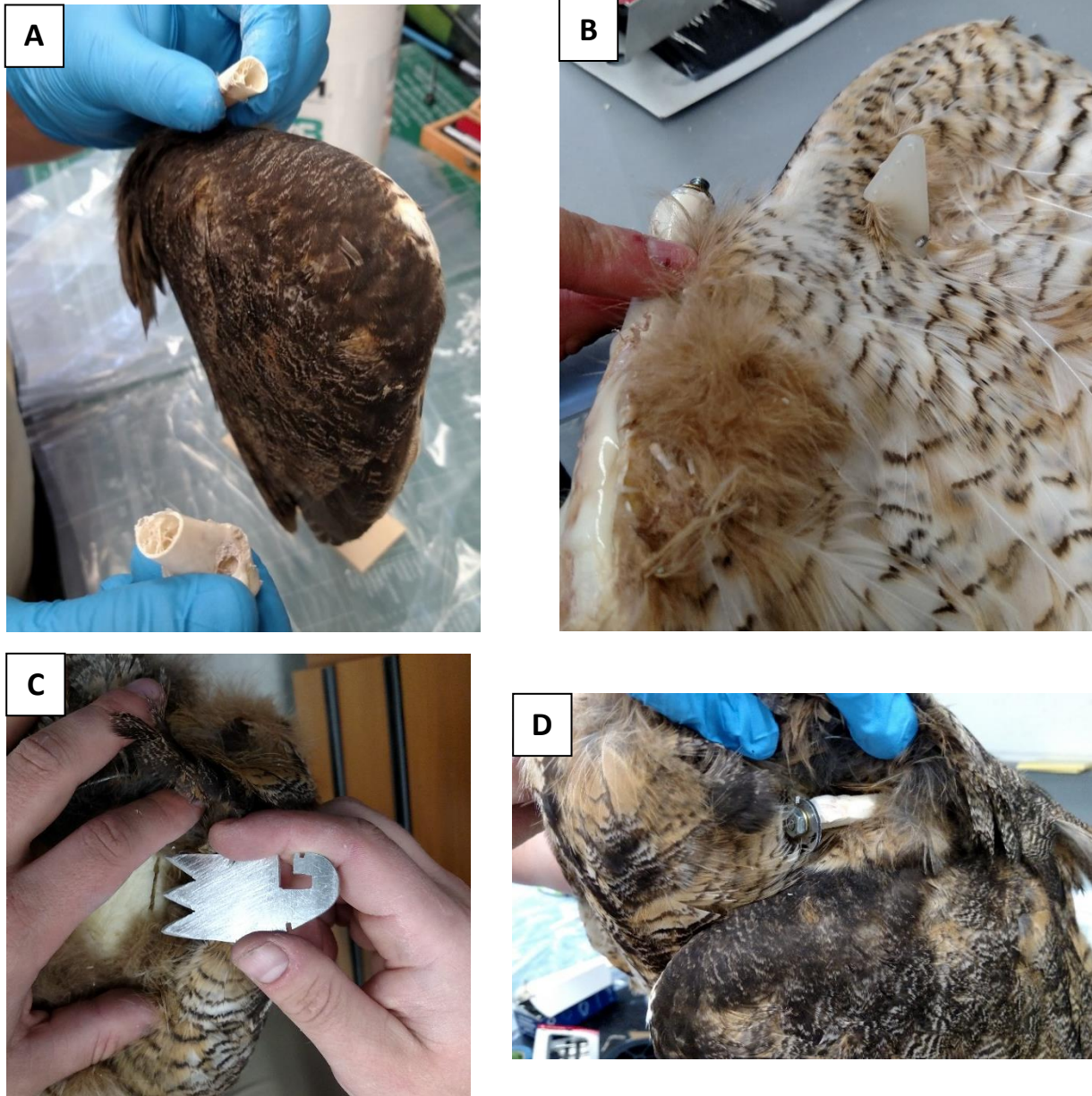
YEAR	SEX	STATE	OWL TYPE	VOCALIZATIONS USED?*	CAPTURE HISTORY	ORDER CAUGHT	TIME TO CAPTURE
2016	F	NY	Live	Y	First	1	9
2005	F	PA	Live	N	First	1	10
2005	M	PA	Live	N	First	2	61
2010	F	PA	Live	N	First	1	15
2010	F	PA	Live	N	First	1	40
2010	F	PA	Live	N	Recap	1	15
2011	F	PA	Live	N	First	1	5
2011	F	PA	Live	N	First	1	10
2012	M	PA	Live	N	First	1	10
2012	F	PA	Live	N	Recap	1	5
2012	F	PA	Live	N	Recap	1	10
2012	M	PA	Live	N	First	2	5
2012	F	PA	Live	N	First	2	180
2013	F	PA	Live	N	First	1	25
2013	M	PA	Live	N	First	1	6
2013	F	PA	Live	N	First	1	4
2013	F	PA	Live	N	Recap	1	30
2013	M	PA	Live	Y	First	2	68
2013	F	PA	Live	N	Recap	2	23
2014	F	PA	Live	Y	First	1	1
2014	F	PA	Live	Y	First	1	55
2014	F	PA	Live	Y	Recap	1	38
2014	F	PA	Live	Y	Recap	1	3
2014	M	PA	Live	Y	Recap	2	3
2015	M	PA	Live	Y	First	1	12
2015	M	PA	Live	Y	Recap	1	13
2015	F	PA	Live	Y	First	2	94
2015	F	PA	Live	Y	Recap	2	51
2016	F	PA	Live	Y	First	1	5
2016	F	PA	Live	Y	First	1	14
2016	F	PA	Live	Y	First	1	9
2016	M	PA	Live	Y	First	1	18
2016	M	PA	Live	Y	First	2	15
2016	F	PA	Live	Y	First	2	19
2015	M	NY	Mechanical	Y	First	1	30
2015	F	NY	Mechanical	Y	First	1	10
2015	F	NY	Mechanical	Y	First	1	10
2015	F	NY	Mechanical	Y	First	1	10
2015	F	NY	Mechanical	Y	First	1	5

2015	M	NY	Mechanical	Y	First	1	30
2015	M	NY	Mechanical	Y	First	2	30
2015	M	NY	Mechanical	Y	First	2	10
2016	F	NY	Mechanical	Y	First	1	10
2016	F	NY	Mechanical	Y	First	1	10
2016	M	NY	Mechanical	Y	First	1	2
2016	F	NY	Mechanical	Y	First	1	4
2016	M	NY	Mechanical	Y	First	1	1
2016	F	NY	Mechanical	Y	First	1	2
2016	F	NY	Mechanical	Y	First	1	1
2016	M	NY	Mechanical	Y	Recap	1	9
2016	F	NY	Mechanical	Y	Recap	1	1
2016	M	NY	Mechanical	Y	First	2	15
2016	F	NY	Mechanical	Y	First	2	25
2017	F	NY	Mechanical	Y	First	1	11
2017	F	NY	Mechanical	Y	First	1	6
2017	F	NY	Mechanical	Y	First	1	8
2017	M	NY	Mechanical	Y	First	1	3
2017	M	NY	Mechanical	Y	Recap	1	26
2017	M	NY	Mechanical	Y	First	2	3
2017	M	NY	Mechanical	Y	First	2	23
2017	M	NY	Mechanical	Y	First	2	8
2017	F	NY	Mechanical	Y	Recap	2	24
2017	M	PA	Mechanical	Y	First	1	7
2017	F	PA	Mechanical	Y	First	1	9
2017	F	PA	Mechanical	Y	First	2	21
2017	M	PA	Mechanical	Y	First	2	5

*Vocalizations were broadcast using a FoxPro game caller (Lewiston, PA USA) and when used, included a variety of conspecific alarm calls and Great Horned Owl calls.



Supplemental Figure 1. Photograph demonstrating the two connector plates containing magnets for attachment of the mechanical lure owl head. The magnets allow for the head to fall off easily if struck by an attacking raptor during trapping efforts.



Supplemental Figure 2. Photographs demonstrating wing preparation and attachment points: (A) exposed humerus bone, sawed off at the top, (B) bolt permanently affixed inside humerus and push-rod connection horn on inner wing, (C) custom-made aluminum insert for wing attachment to the body, and (D) humerus bolt in L-shaped slot of the aluminum piece with Nyloc nut on the end of the bolt, allowing for rotating movement of the wing.