

CONTENTS

Acknowledgments ix

Author Contributions x

CHAPTER 1 Discovering Unknown Migrations 1

CHAPTER 2 A New Age of Animal Tracking: *Approaches and Tools for Quantifying Migratory Connectivity* 8

CHAPTER 3 Atlas Methods 23

CHAPTER 4 Guide to Species Accounts 28

DUCKS, GEESE, AND WATERFOWL (Anseriformes)	33
FAMILY ANATIDAE	
— Ducks, Geese, and Waterfowl	33
Black-bellied Whistling Duck	34
Fulvous Whistling-Duck	35
Emperor Goose	36
Snow Goose	37
Ross's Goose	41
Greater White-fronted Goose	43
Brant	45
Cackling Goose	47
Canada Goose	49
Trumpeter Swan	53
Tundra Swan	54
Wood Duck	56
Blue-winged Teal	58
Cinnamon Teal	62
Northern Shoveler	64
Gadwall	66
American Wigeon	68
Mallard	70
American Black Duck	73
Northern Pintail	75
Green-winged Teal	78
Canvasback	80
Redhead	82
Ring-necked Duck	83
Greater Scaup	85
Lesser Scaup	86
Steller's Eider	88
Spectacled Eider	89
King Eider	90
Common Eider	92
Harlequin Duck	94
Surf Scoter	95
White-winged Scoter	96
Black Scoter	98
Long-tailed Duck	99
Bufflehead	101
Common Goldeneye	102
Barrow's Goldeneye	103
Hooded Merganser	104
Common Merganser	105
Red-breasted Merganser	106
Ruddy Duck	107

PIGEONS AND DOVES (Columbiformes)	109
FAMILY COLUMBIDAE	
— Pigeons and Doves	109
White-crowned Pigeon	109
Red-billed Pigeon	110
Band-tailed Pigeon	110
White-winged Dove	112
Mourning Dove	113

CUCKOOS (Cuculiformes)	116
FAMILY CUCULIDAE	
— Cuckoos	116
Groove-billed Ani	116
Yellow-billed Cuckoo	117
Black-billed Cuckoo	119

NIGHTJARS AND ALLIES (Caprimulgiformes)	120
FAMILY CAPRIMULGIDAE	
— Nightjars and Allies	120
Lesser Nighthawk	120
Common Nighthawk	121
Antillean Nighthawk	123
Common Poorwill	124
Chuck-will's-widow	124
Buff-collared Nightjar	125
Eastern Whip-poor-will	126
Mexican Whip-poor-will	128

SWIFTS AND HUMMINGBIRDS (Apodiformes)	129
FAMILY APODIDAE	
— Swifts	130
Black Swift	130
Chimney Swift	131
Vaux's Swift	132
White-throated Swift	132

FAMILY TROCHILIDAE	
— Hummingbirds	133
Rivoli's Hummingbird	133
Blue-throated Mountain-gem	133
Lucifer Hummingbird	134
Ruby-throated Hummingbird	134
Black-chinned Hummingbird	135
Anna's Hummingbird	136
Costa's Hummingbird	136
Calliope Hummingbird	137
Rufous Hummingbird	137
Allen's Hummingbird	138
Broad-tailed Hummingbird	139
Broad-billed Hummingbird	140
Violet-crowned Hummingbird	140
Buff-bellied Hummingbird	141

RAILS, COOTS, AND CRANES (Gruiformes)	142
FAMILY RALLIDAE	
— Rails, Gallinules, and Coots	143
King Rail	143
Clapper Rail	144
Virginia Rail	145
Sora	146
Common Gallinule	147
American Coot	148
Purple Gallinule	150
Yellow Rail	151
Black Rail	152

FAMILY GRUIDAE	
— Cranes	153
Sandhill Crane	153
Whooping Crane	155

SHOREBIRDS, AUKS, GULLS, AND TERNS (Charadriiformes)	157
---	------------

FAMILY RECURVIROSTRIDAE	
— Stilts and Avocets	159
Black-necked Stilt	159
American Avocet	160

FAMILY HAEMATOPODIDAE	
— Oystercatchers	161
American Oystercatcher	161
Black Oystercatcher	162

FAMILY CHARADRIIDAE	
— Plovers and Lapwings	164
Black-bellied Plover	164
American Golden-Plover	166
Pacific Golden-Plover	168
Killdeer	169
Common Ringed Plover	170
Semipalmated Plover	171
Piping Plover	172
Mountain Plover	173
Snowy Plover	175
Wilson's Plover	176

FAMILY SCOLOPACIDAE	
— Sandpipers and Allies	177
Upland Sandpiper	177
Bristle-thighed Curlew	178
Hudsonian Whimbrel	179
Long-billed Curlew	181
Bar-tailed Godwit	183
Hudsonian Godwit	184
Marbled Godwit	185
Ruddy Turnstone	186
Black Turnstone	188
Red Knot	189
Surfbird	192
Stilt Sandpiper	193
Sanderling	194
Dunlin	195
Rock Sandpiper	197
Purple Sandpiper	198
Baird's Sandpiper	199
Least Sandpiper	200
White-rumped Sandpiper	201
Buff-breasted Sandpiper	202
Pectoral Sandpiper	204
Semipalmated Sandpiper	206
Western Sandpiper	208
Short-billed Dowitcher	210
Long-billed Dowitcher	212
American Woodcock	213
Wilson's Snipe	216
Spotted Sandpiper	217
Solitary Sandpiper	218
Wandering Tattler	219

CONTENTS

Lesser Yellowlegs	220	Sandwich Tern	341	Wedge-tailed Shearwater	400
Willet	222	Elegant Tern	342	Buller's Shearwater	402
Greater Yellowlegs	224	Black Skimmer	343	Short-tailed Shearwater	402
Wilson's Phalarope	225			Sooty Shearwater	404
Red-necked Phalarope	226			Great Shearwater	406
Red Phalarope	227			Pink-footed Shearwater	408
FAMILY STERCORARIIDAE		GREBES		Flesh-footed Shearwater	409
— Skuas and Jaegers	229	(Podicipediformes)	346	Christmas Shearwater	410
Great Skua	229	FAMILY PODICIPEDIDAE		Manx Shearwater	410
South Polar Skua	231	— Grebes	346	Townsend's Shearwater	411
Pomarine Jaeger	232	Pied-billed Grebe	346	Newell's Shearwater	412
Parasitic Jaeger	234	Horned Grebe	347	Black-vented Shearwater	413
Long-tailed Jaeger	237	Red-necked Grebe	348	Sargasso Shearwater	414
		Eared Grebe	348		
		Western Grebe	349		
		Clark's Grebe	351		
FAMILY ALCIDAE				STORKS	
— Auks, Murres, and Puffins	240	TROPICBIRDS		(Ciconiiformes)	415
Dovekie	240	(Phaethontiformes)	352	FAMILY CICONIIDAE	
Common Murre	241	FAMILY PHAETHONTIDAE		— Storks	415
Thick-billed Murre	245	— Tropicbirds	352	Wood Stork	415
Razorbill	250	White-tailed Tropicbird	352		
Black Guillemot	252	Red-billed Tropicbird	354		
Pigeon Guillemot	255	Red-tailed Tropicbird	354		
Marbled Murrelet	256			FRIGATEBIRDS, BOOBIES,	
Kittlitz's Murrelet	258			GANNETS, ANHINGAS, AND	
Scripps's Murrelet	260			CORMORANTS	
Guadalupe Murrelet	260	LOONS		(Suliformes)	417
Craveri's Murrelet	261	(Gaviiformes)	356	FAMILY FREGATIDAE	
Ancient Murrelet	261	FAMILY GAVIIDAE		— Frigatebirds	418
Cassin's Auklet	263	— Loons	357	Magnificent Frigatebird	418
Parakeet Auklet	266	Red-throated Loon	357		
Least Auklet	267	Arctic Loon	359	FAMILY SULIDAE	
Crested Auklet	268	Pacific Loon	360	— Boobies and Gannets	419
Rhinoceros Auklet	269	Common Loon	362	Masked Booby	419
Atlantic Puffin	271	Yellow-billed Loon	364	Brown Booby	421
Horned Puffin	274			Northern Gannet	423
Tufted Puffin	275				
FAMILY LARIDAE		ALBATROSSES, PETRELS,		FAMILY ANHINGIDAE	
— Gulls, Terns, and Skimmers	277	AND SHEARWATERS		— Anhingas	425
Black-legged Kittiwake	277	(Procellariiformes)	366	Anhinga	425
Red-legged Kittiwake	283	FAMILY DIOMEDEIDAE			
Ivory Gull	285	— Albatrosses	367	FAMILY PHALACROCORACIDAE	
Sabine's Gull	287	Laysan Albatross	367	— Cormorants and Shags	426
Bonaparte's Gull	289	Black-footed Albatross	371	Brandt's Cormorant	426
Little Gull	290	Short-tailed Albatross	374	Pelagic Cormorant	427
Ross's Gull	291			Great Cormorant	429
Laughing Gull	292	FAMILY OCEANITIDAE		Double-crested Cormorant	430
Franklin's Gull	294	— Southern Storm-Petrels	376		
Heermann's Gull	296	Wilson's Storm-Petrel	376	PELICANS, HERONS,	
Short-billed Gull	297	White-faced Storm-Petrel	377	EGRETS, BITTERNS,	
Ring-billed Gull	298			IBISES, AND SPOONBILLS	
Western Gull	300	FAMILY HYDROBATIDAE		(Pelecaniformes)	433
California Gull	302	— Northern Storm-Petrels	377	FAMILY PELECANIDAE	
Herring Gull	304	Fork-tailed Storm-Petrel	377	— Pelicans	434
Iceland Gull	307	Leach's Storm-Petrel	378	American White Pelican	434
Lesser Black-backed Gull	308	Townsend's Storm-Petrel	381	Brown Pelican	436
Glaucous-winged Gull	309	Ainley's Storm-Petrel	381		
Glaucous Gull	311	Ashy Storm-Petrel	382	FAMILY ARDEIDAE	
Great Black-backed Gull	313	Band-rumped Storm-Petrel	383	— Hérons, Egrets, and Bitterns	439
Brown Noddy	316	Black Storm-Petrel	383	Least Bittern	439
Black Noddy	317	Tristram's Storm-Petrel	384	American Bittern	440
Sooty Tern	318	Least Storm-Petrel	384	Little Blue Heron	441
Gray-backed Tern	321			Tricolored Heron	442
Bridled Tern	322	FAMILY PROCELLARIIDAE		Reddish Egret	443
Aleutian Tern	322	— Shearwaters and Petrels	385	Snowy Egret	444
Least Tern	323	Northern Fulmar	385	Yellow-crowned Night Heron	445
Gull-billed Tern	325	Trindade Petrel	387	Black-crowned Night Heron	446
Caspian Tern	326	Murphy's Petrel	388	Green Heron	448
Black Tern	328	Mottled Petrel	389	Great Egret	449
Roseate Tern	330	Bermuda Petrel	390	Western Cattle-Egret	451
Common Tern	331	Black-capped Petrel	391	Great Blue Heron	452
Arctic Tern	335	Juan Fernandez Petrel	392		
Forster's Tern	337	Hawaiian Petrel	392	FAMILY THRESKIORNITHIDAE	
Royal Tern	338	Bonin Petrel	393	— Ibises and Spoonbills	454
		Black-winged Petrel	394	White Ibis	454
		Desertas Petrel	395	Glossy Ibis	455
		Fea's Petrel	396	White-faced Ibis	456
		Cook's Petrel	397	Roseate Spoonbill	458
		Bulwer's Petrel	398		
		Cory's Shearwater	399		

NEW WORLD VULTURES (Cathartiformes)	459	Red-breasted Sapsucker	516	FAMILY CORVIDAE	
FAMILY CATHARTIDAE		Northern Flicker	516	— Crows, Jays, and Magpies	561
— New World Vultures	459	FALCONS AND CARACARAS (Falconiformes)	518	Blue Jay	561
Black Vulture	459	FAMILY FALCONIDAE		American Crow	562
Turkey Vulture	461	— Falcons and Caracaras	519	Fish Crow	563
HAWKS, EAGLES, KITES, AND OSPREY (Accipitriformes)	463	American Kestrel	519	FAMILY ALAUDIDAE	
FAMILY PANDIONIDAE		Merlin	521	— Larks	564
— Osprey	464	Aplomado Falcon	522	Horned Lark	564
Osprey	464	Gyr Falcon	523	FAMILY HIRUNDINIDAE	
FAMILY ACCIPITRIDAE		Peregrine Falcon	524	— Swallows	565
— Hawks, Eagles, and Kites	467	Prairie Falcon	528	Bank Swallow	565
Swallow-tailed Kite	467	SONGBIRDS (Passeriformes)	530	Tree Swallow	566
Golden Eagle	469	FAMILY TITYRIDAE		Violet-green Swallow	567
Sharp-shinned Hawk	472	— Tityras and Allies	531	Northern Rough-winged Swallow	568
Cooper's Hawk	473	Rose-throated Becard	531	Purple Martin	568
American Goshawk	474	FAMILY TYRANNIDAE		Barn Swallow	570
Northern Harrier	476	— Tyrant Flycatchers	532	Cliff Swallow	571
Bald Eagle	478	Northern Beardless-Tyrannulet	532	Cave Swallow	572
Mississippi Kite	480	Dusky-capped Flycatcher	532	FAMILY PHYLLOSCOPIDAE	
Common Black Hawk	481	Ash-throated Flycatcher	533	— Leaf Warblers	573
Gray Hawk	482	Great Crested Flycatcher	533	Arctic Warbler	573
Red-shouldered Hawk	483	Brown-crested Flycatcher	534	FAMILY REGULIDAE	
Broad-winged Hawk	484	Sulphur-bellied Flycatcher	534	— Kinglets	573
Short-tailed Hawk	486	Tropical Kingbird	535	Ruby-crowned Kinglet	573
Swainson's Hawk	487	Couch's Kingbird	535	Golden-crowned Kinglet	574
Zone-tailed Hawk	488	Cassin's Kingbird	536	FAMILY BOMBYCILLIDAE	
Red-tailed Hawk	489	Thick-billed Kingbird	536	— Waxwings	574
Rough-legged Hawk	492	Western Kingbird	537	Bohemian Waxwing	574
Ferruginous Hawk	493	Eastern Kingbird	538	Cedar Waxwing	575
OWLS (Strigiformes)	496	Gray Kingbird	539	FAMILY PTILOGONATIDAE	
FAMILY TYTONIDAE		Scissor-tailed Flycatcher	540	— Silky-flycatchers	576
— Barn Owls	497	Olive-sided Flycatcher	540	Phainopepla	576
American Barn Owl	497	Greater Pewee	542	FAMILY SITTIDAE	
FAMILY STRIGIDAE		Western Wood-Pewee	542	— Nuthatches	577
— Owls	498	Eastern Wood-Pewee	543	Red-breasted Nuthatch	577
Flammulated Owl	498	Yellow-bellied Flycatcher	543	FAMILY CERTHIIDAE	
Snowy Owl	499	Acadian Flycatcher	544	— Treecreepers	577
Elf Owl	501	Alder Flycatcher	544	Brown Creeper	577
Burrowing Owl	502	Willow Flycatcher	545	FAMILY POLIOPTILIDAE	
Spotted Owl	504	Least Flycatcher	545	— Gnatcatchers	578
Long-eared Owl	505	Hammond's Flycatcher	546	Blue-gray Gnatcatcher	578
Short-eared Owl	506	Gray Flycatcher	547	FAMILY TROGLODYTIDAE	
Northern Saw-whet Owl	508	Dusky Flycatcher	547	— Wrens	579
TROGONS (Trogoniformes)	509	Western Flycatcher	548	Rock Wren	579
FAMILY TROGONIDAE		Buff-breasted Flycatcher	549	Bewick's Wren	579
— Trogons	509	Black Phoebe	549	Northern House Wren	580
Elegant Trogon	509	Eastern Phoebe	550	Pacific Wren	581
KINGFISHERS (Coraciiformes)	510	Say's Phoebe	551	Winter Wren	581
FAMILY ALCEDINIDAE		Vermilion Flycatcher	551	Sedge Wren	582
— Kingfishers	510	FAMILY VIREONIDAE		Marsh Wren	582
Belted Kingfisher	510	— Vireos	552	FAMILY MIMIDAE	
WOODPECKERS (Piciformes)	511	Black-capped Vireo	552	— Mockingbirds and Thrashers	583
FAMILY PICIDAE		White-eyed Vireo	552	Gray Catbird	583
— Woodpeckers	511	Bell's Vireo	553	Brown Thrasher	584
Lewis's Woodpecker	511	Gray Vireo	554	Bendire's Thrasher	585
Red-headed Woodpecker	512	Yellow-throated Vireo	554	Sage Thrasher	586
Red-bellied Woodpecker	513	Cassin's Vireo	555	Northern Mockingbird	586
Williamson's Sapsucker	514	Blue-headed Vireo	555	FAMILY TURDIDAE	
Yellow-bellied Sapsucker	514	Plumbeous Vireo	556	— Thrushes	587
Red-naped Sapsucker	515	Philadelphia Vireo	556	Eastern Bluebird	587
		Warbling Vireo	557	Western Bluebird	588
		Red-eyed Vireo	557	Mountain Bluebird	589
		Black-whiskered Vireo	559	Townsend's Solitaire	590
		FAMILY LANIIDAE		Veery	590
		— Shrikes	559	Gray-cheeked Thrush	592
		Loggerhead Shrike	559	Bicknell's Thrush	593
		Northern Shrike	560	Swainson's Thrush	595
				Hermit Thrush	597
				Wood Thrush	599

CONTENTS

American Robin	600	Dark-eyed Junco	634	Tennessee Warbler	680
Varied Thrush	603	White-crowned Sparrow	635	Orange-crowned Warbler	681
FAMILY MUSCICAPIDAE		Golden-crowned Sparrow	636	Colima Warbler	682
— Old World Flycatchers	604	Harris's Sparrow	638	Lucy's Warbler	682
Bluethroat	604	White-throated Sparrow	639	Nashville Warbler	683
Northern Wheatear	604	Bell's Sparrow	640	Virginia's Warbler	684
FAMILY PEUCEDRAMIDAE		Sagebrush Sparrow	640	Connecticut Warbler	684
— Olive Warbler	605	Vesper Sparrow	641	MacGillivray's Warbler	685
Olive Warbler	605	LeConte's Sparrow	642	Mourning Warbler	686
FAMILY MOTACILLIDAE		Seaside Sparrow	642	Kentucky Warbler	686
— Wagtails and Pipits	606	Nelson's Sparrow	643	Common Yellowthroat	687
Eastern Yellow Wagtail	606	Saltmarsh Sparrow	644	Hooded Warbler	688
White Wagtail	606	Baird's Sparrow	644	American Redstart	689
Red-throated Pipit	607	Henslow's Sparrow	645	Kirtland's Warbler	690
American Pipit	607	Savannah Sparrow	646	Cape May Warbler	692
Sprague's Pipit	608	Song Sparrow	647	Cerulean Warbler	692
FAMILY FRINGILLIDAE		Lincoln's Sparrow	648	Northern Parula	694
— Finches, Euphonias, and Allies	608	Swamp Sparrow	649	Tropical Parula	694
Evening Grosbeak	608	Green-tailed Towhee	650	Magnolia Warbler	695
Gray-crowned Rosy-Finch	610	Spotted Towhee	650	Bay-breasted Warbler	695
Black Rosy-Finch	610	Eastern Towhee	651	Blackburnian Warbler	696
Brown-capped Rosy-Finch	611				
Purple Finch	611	FAMILY ICTERIIDAE		Yellow Warbler	696
Cassin's Finch	613	— Yellow-breasted Chat	652	Chestnut-sided Warbler	698
Redpoll	614	Yellow-breasted Chat	652	Blackpoll Warbler	698
Red Crossbill	615				
White-winged Crossbill	616	FAMILY ICTERIDAE		Black-throated Blue Warbler	700
Pine Siskin	616	— New World Blackbirds and Allies	653	Palm Warbler	701
Lesser Goldfinch	617	Yellow-headed Blackbird	653	Pine Warbler	702
Lawrence's Goldfinch	618	Bobolink	654	Yellow-rumped Warbler	702
American Goldfinch	618	Chihuahuan Meadowlark	655	Yellow-throated Warbler	703
FAMILY CALCARIIDAE		Eastern Meadowlark	656	Prairie Warbler	704
— Longspurs and Snow Buntings	619	Western Meadowlark	657	Grace's Warbler	705
Lapland Longspur	619	Orchard Oriole	658	Black-throated Gray Warbler	706
Chestnut-collared Longspur	620	Hooded Oriole	659	Townsend's Warbler	706
Smith's Longspur	621	Bullock's Oriole	659	Hermit Warbler	707
Thick-billed Longspur	621	Baltimore Oriole	660	Golden-cheeked Warbler	708
Snow Bunting	622	Scott's Oriole	661	Black-throated Green Warbler	708
McKay's Bunting	623	Red-winged Blackbird	661	Canada Warbler	709
FAMILY PASSERELLIDAE		Tricolored Blackbird	663	Wilson's Warbler	710
— New World Sparrows	623	Bronzed Cowbird	664	Red-faced Warbler	711
Botteri's Sparrow	623	Brown-headed Cowbird	664	Painted Redstart	712
Cassin's Sparrow	624	Rusty Blackbird	666		
Bachman's Sparrow	624	Brewer's Blackbird	667	FAMILY CARDINALIDAE	
Grasshopper Sparrow	625	Common Grackle	668	— Tanagers, Grosbeaks, and	
Black-throated Sparrow	626	Boat-tailed Grackle	670	Buntings	712
Lark Sparrow	626	Great-tailed Grackle	670	Hepatic Tanager	712
Lark Bunting	627				
Chipping Sparrow	628	FAMILY PARULIDAE		Summer Tanager	713
Clay-colored Sparrow	629	— New World Warblers	671	Scarlet Tanager	713
Black-chinned Sparrow	630	Ovenbird	671	Western Tanager	714
Field Sparrow	630	Worm-eating Warbler	672	Rose-breasted Grosbeak	715
Brewer's Sparrow	630	Louisiana Waterthrush	673	Black-headed Grosbeak	716
Fox Sparrow	632	Northern Waterthrush	674	Blue Grosbeak	717
American Tree Sparrow	633	Golden-winged Warbler	675	Lazuli Bunting	717
		Blue-winged Warbler	676	Indigo Bunting	718
		Black-and-white Warbler	677	Varied Bunting	719
		Prothonotary Warbler	678	Painted Bunting	719
		Swainson's Warbler	680	Dickcissel	722

Migratory Connectivity Summary 723

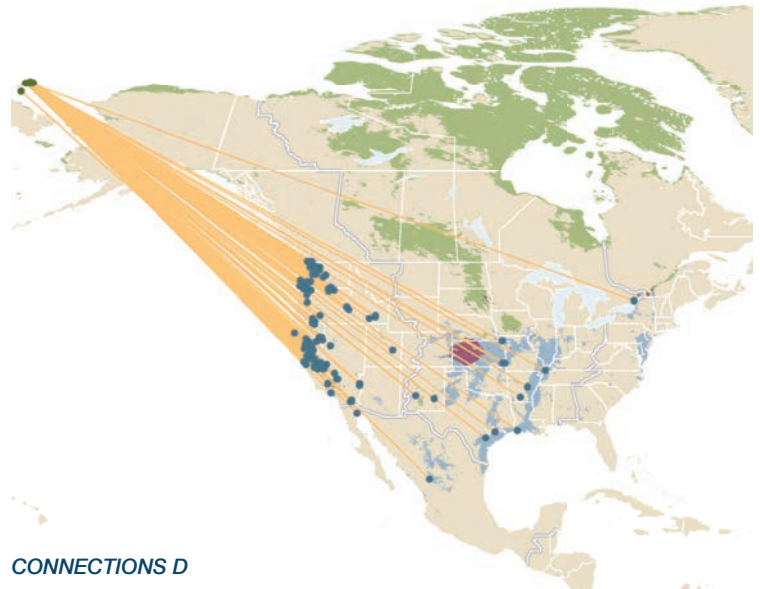
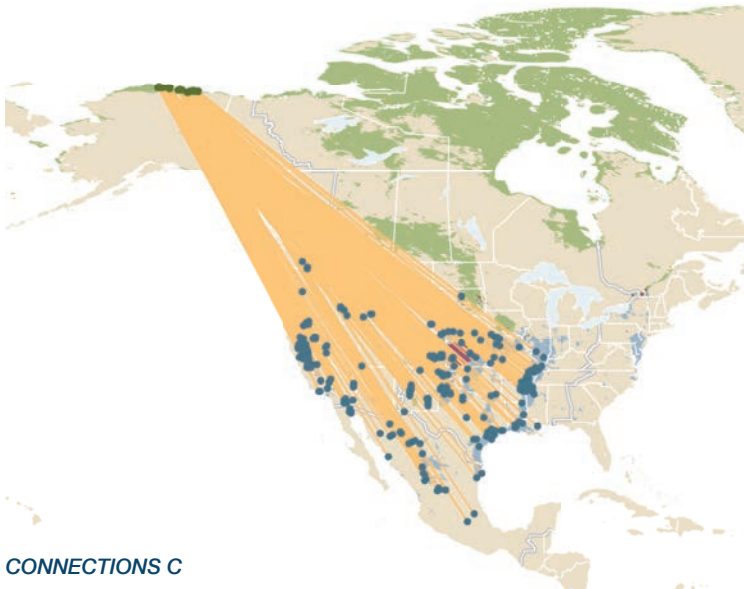
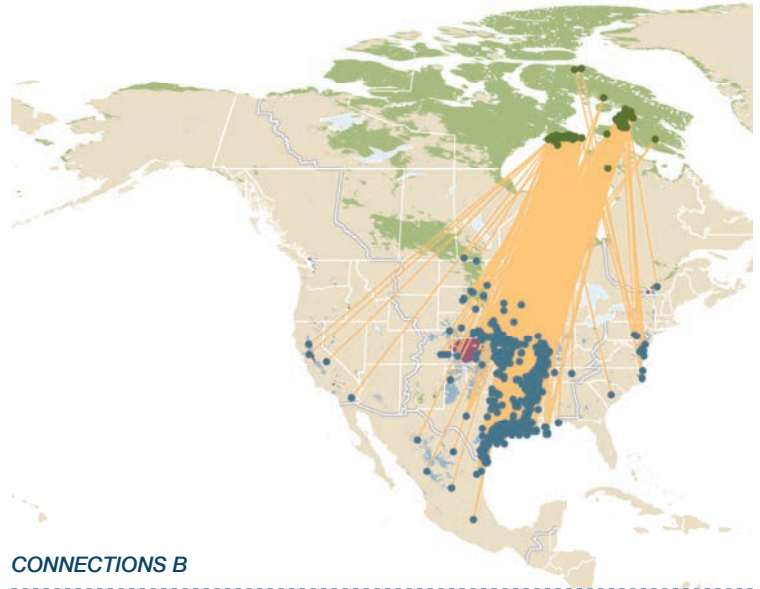
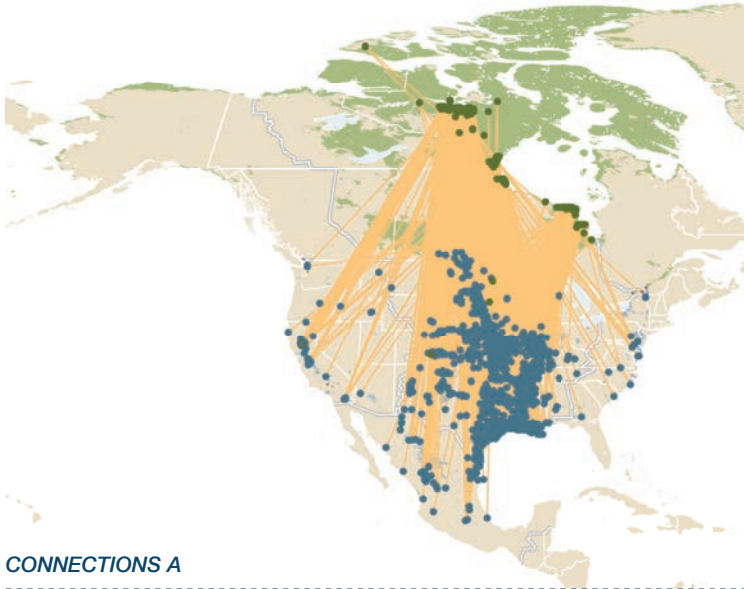
References 724

Dataset Citations 767

Data Contributors 785

Index 795

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

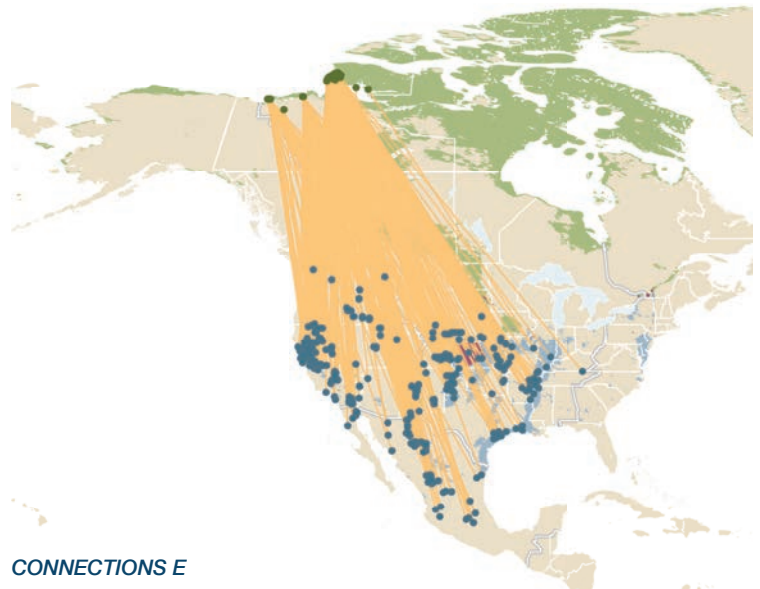


coast have the same breeding distribution as birds spending the nonbreeding season along the Gulf Coast (Humphries et al. 2009).

SATELLITE TRACKING Birds marked during the nonbreeding season in Washington state (Evenson et al., unpublished data) and the Central Valley of California (US Geological Survey and Canadian Wildlife Service, unpublished data) migrated to areas across the western breeding range. This included the western Canadian Arctic, Alaska, and Russia.

STABLE ISOTOPES Stable isotopes of hydrogen (deuterium) measured in feathers varied strongly with increasing latitude, confirming that deuterium is a useful tool for determining breeding population origin and migratory connectivity (Fowler et al. 2018). Individuals sampled during pre-breeding migration in the Rainwater Basin of Nebraska were assigned, using carbon and nitrogen isotopes from muscle tissue, to nonbreeding grounds in Louisiana and the Texas Gulf Coast (Hénaux et al. 2012).

GENETICS Genetic sampling of Lesser Snow Geese breeding at Wrangel Island in Russia and Banks Island in Canada revealed significant differences in mtDNA and homogeneity in nuclear DNA. Gene flow among these breeding populations is likely due to pair formation on nonbreeding grounds (Shorey et al. 2011). There was some genetic differentiation in the nonbreeding populations from Wrangel Island, though the origin of these differences was not clear (Kuznetsov et al. 1998).



MIGRATORY PATHWAYS During fall migration, birds stage along southern Hudson Bay and the northern Great Plains before migrating south to nonbreeding areas.

Anser rossii **ROSS'S GOOSE**

DISTRIBUTION AND ABUNDANCE

Ross's Geese nest in colonies, primarily in the central Canadian Arctic around Queen Maud Gulf. The main nonbreeding areas are in California's Central Valley, the southern Great Plains, and the Mississippi Valley, but they can be found in other parts of the United States and Mexico (Baldassarre 2014).



ORDER Anseriformes

FAMILY Anatidae

BREEDING HABITAT Wetlands, Tundra

NONBREEDING HABITAT Wetlands, Generalist

GLOBAL POPULATION SIZE 2,100,000

POPULATION CHANGE SINCE 1970 +7354%

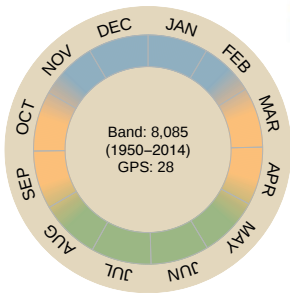
IUCN RED LIST CATEGORY Least Concern

R2R TIPPING POINT SPECIES No

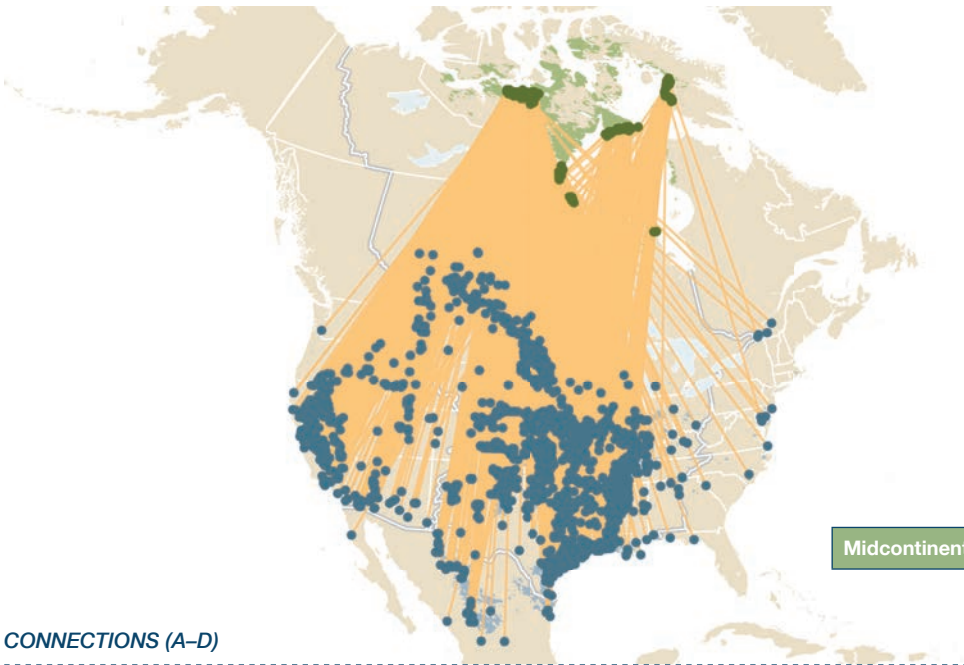
US LISTING STATUS No

CANADA SPECIES AT RISK No

PIF CCS 12/20

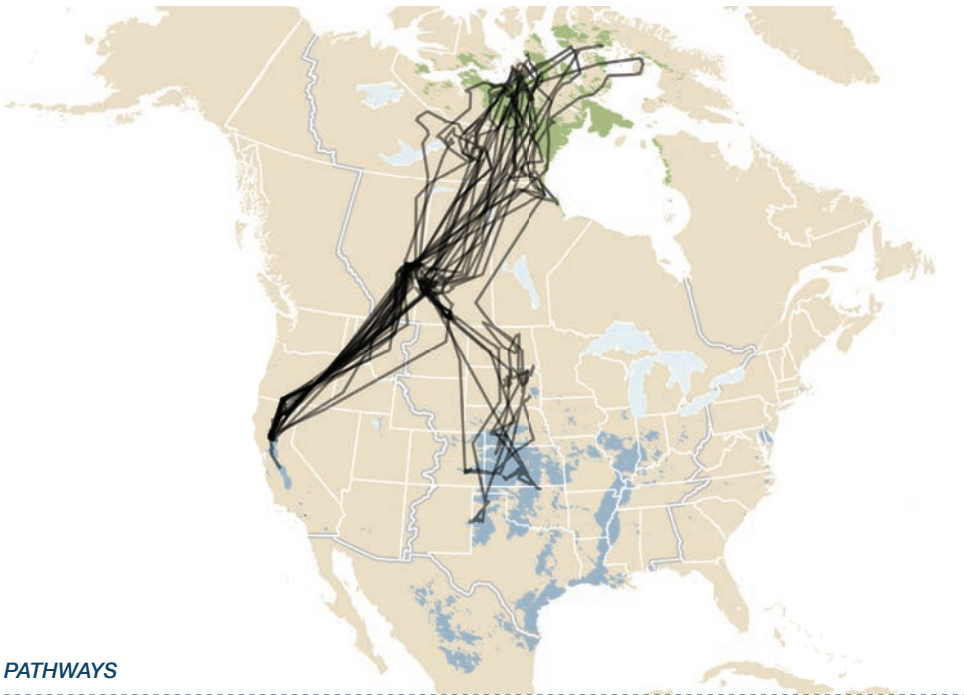


GENERALIZED CONNECTIVITY



	Atlantic	Mexico	Midcontinent	Pacific
Midcontinent (n = 8085)	<1%	1%	55%	44%

CONNECTIONS (A-D)



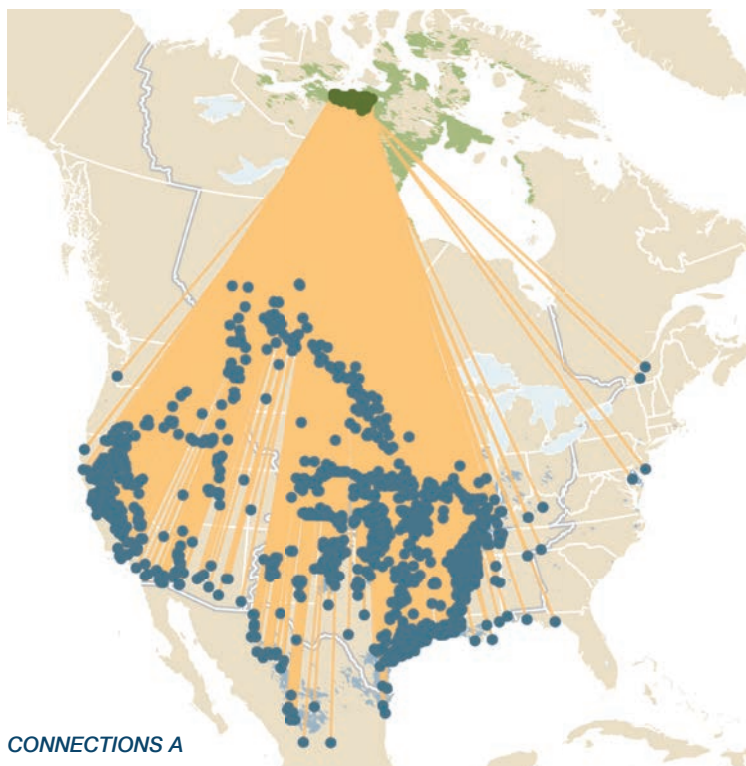
PATHWAYS

MIGRATORY CONNECTIVITY

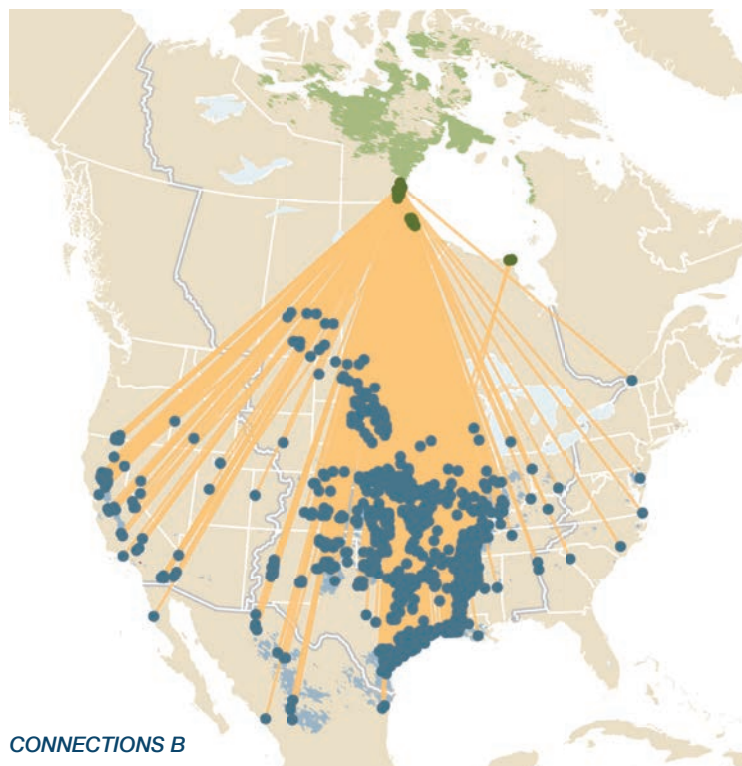
OVERALL Ross's Geese are a relatively well-studied species, and migratory connectivity data is based on banding and satellite tracking data. All birds breed in the Midcontinent Flyway and migrate to nonbreeding areas within the Midcontinent Flyway (55%) or to the Pacific Flyway (44%), and a small percentage to Mexico (1%). Because of the single breeding flyway, MC cannot be calculated.

BANDING Individuals (n = 2,251) banded in the central Arctic were recovered on nonbreeding areas in the United States (68%), Canada (30%), and Mexico (2%). Between 1989 and 2001, banding recoveries shifted eastward from the Pacific Flyway to the midcontinent United States (Alisauskas et al. 2006). Birds banded around Queen Maud Gulf, Canada, were recovered in Canada, California, and the midcontinent United States, while individuals banded in west Hudson Bay were recovered farther east (Alisauskas et al. 2012).

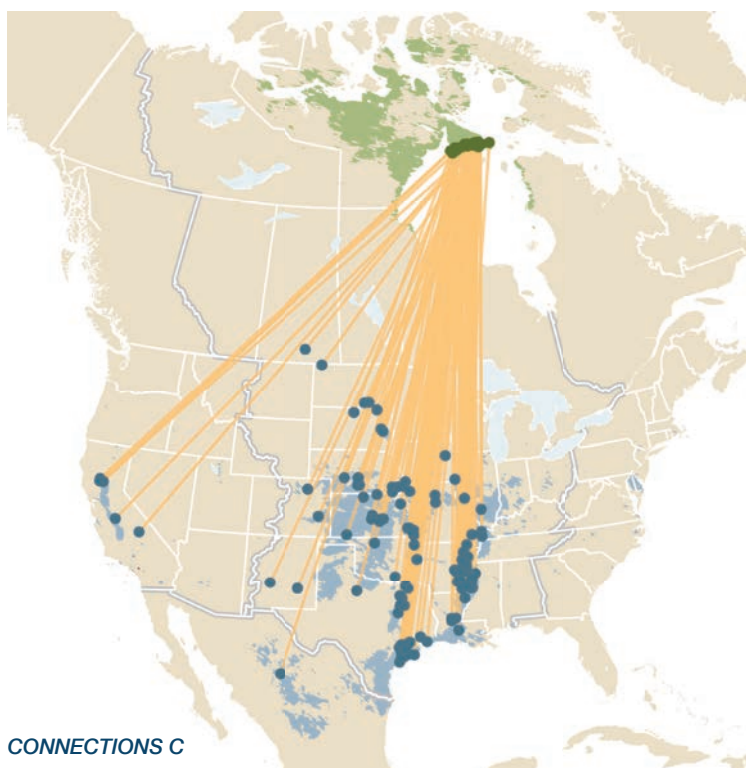
DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)



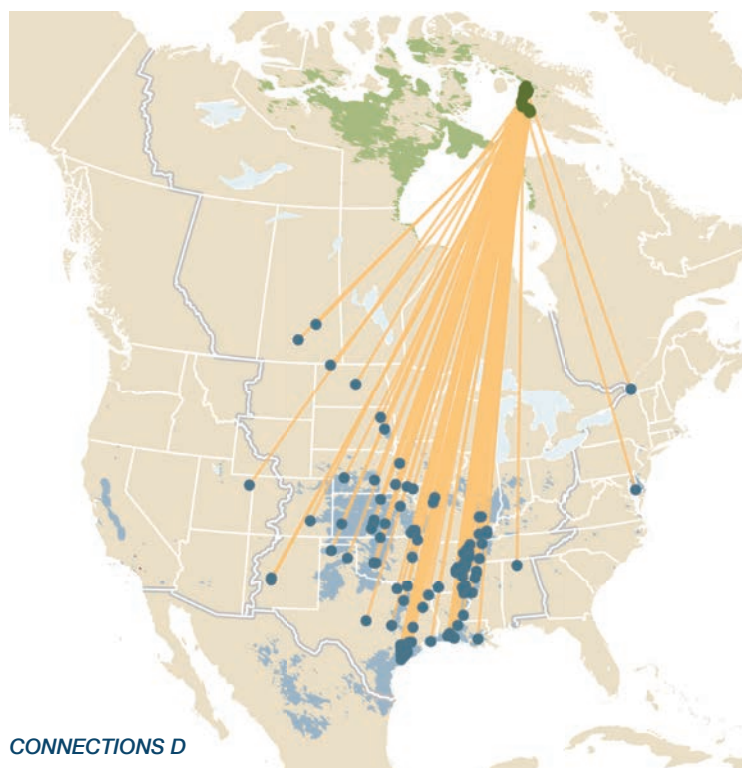
CONNECTIONS A



CONNECTIONS B



CONNECTIONS C



CONNECTIONS D

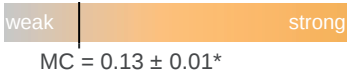
SATELLITE TRACKING Ross's Geese marked in California migrated to the area around Queen Maud Gulf, while those marked in the southern Great Plains migrated to breed on the west coast of Hudson Bay (US Geological Survey, unpublished data). All birds staged in southern Alberta and Saskatchewan.

OTHER APPROACHES No genetic or stable isotope studies of migratory connectivity were found for this species.

DATA CONTRIBUTORS

M. Casazza; C. Nicolai; C. Overton; V. Patil; M. Petrie; E. Reed.

MIGRATORY PATHWAYS There are two primary migration paths from central Arctic breeding areas. The westerly pathway goes through Saskatchewan, then west over the Rocky Mountains to nonbreeding areas in California's Central Valley. The more easterly route follows the west coast of Hudson Bay south through Manitoba, then down the Mississippi River Valley to midcontinent nonbreeding areas.



Anser albifrons

GREATER WHITE-FRONTED GOOSE

DISTRIBUTION AND ABUNDANCE

Greater White-fronted Geese have a circumpolar Arctic breeding distribution that consists of four subspecies. Two of the subspecies occur in North America: the Pacific Greater White-fronted Goose and the Tule Greater White-fronted Goose. Nonbreeding concentrations occur in California's Central Valley, the Mississippi Alluvial Valley, and the southern Great Plains of the United States and Mexico (Fink et al. 2023).



ORDER Anseriformes

FAMILY Anatidae

BREEDING HABITAT Wetlands, Tundra

NONBREEDING HABITAT Wetlands, Generalist

GLOBAL POPULATION SIZE 5,500,000

POPULATION CHANGE SINCE 1970 +544%

IUCN RED LIST CATEGORY Least Concern

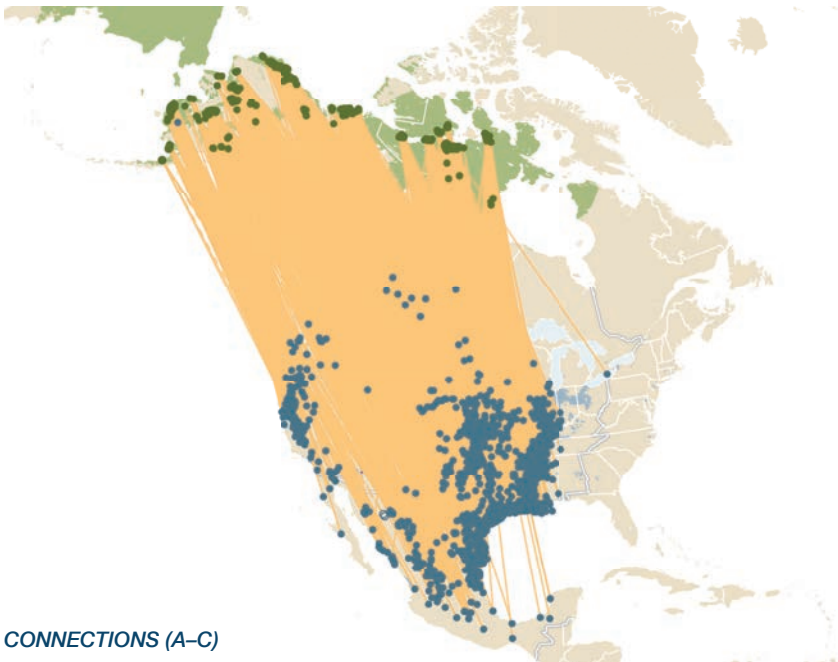
R2R TIPPING POINT SPECIES No

US LISTING STATUS No

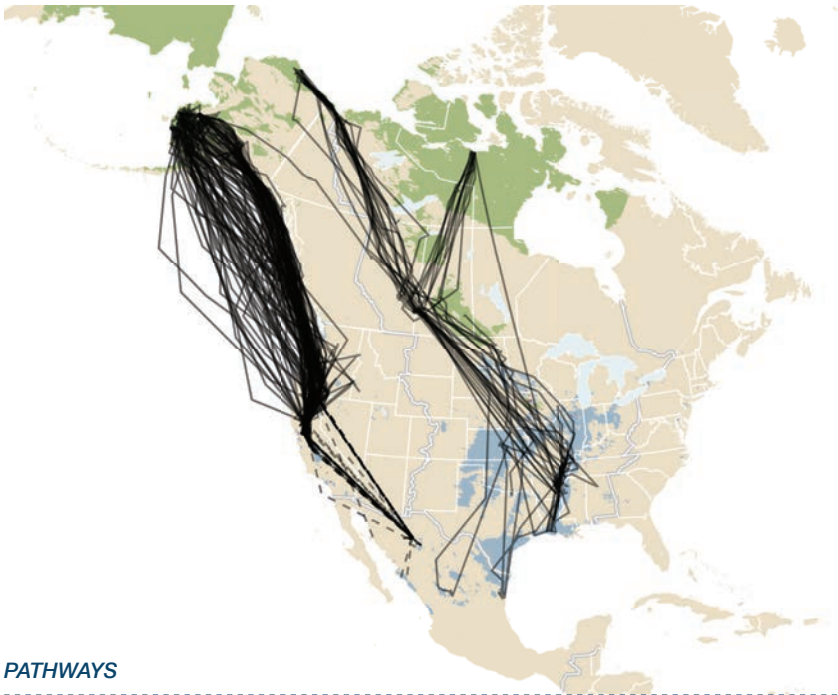
CANADA SPECIES AT RISK No

PIF CCS 9/20

GENERALIZED CONNECTIVITY



CONNECTIONS (A–C)



PATHWAYS

	Mexico	Midcontinent	Pacific
Midcontinent (n = 6964)	3%	97%	<1%
Pacific (n = 4659)	14%	58%	27%

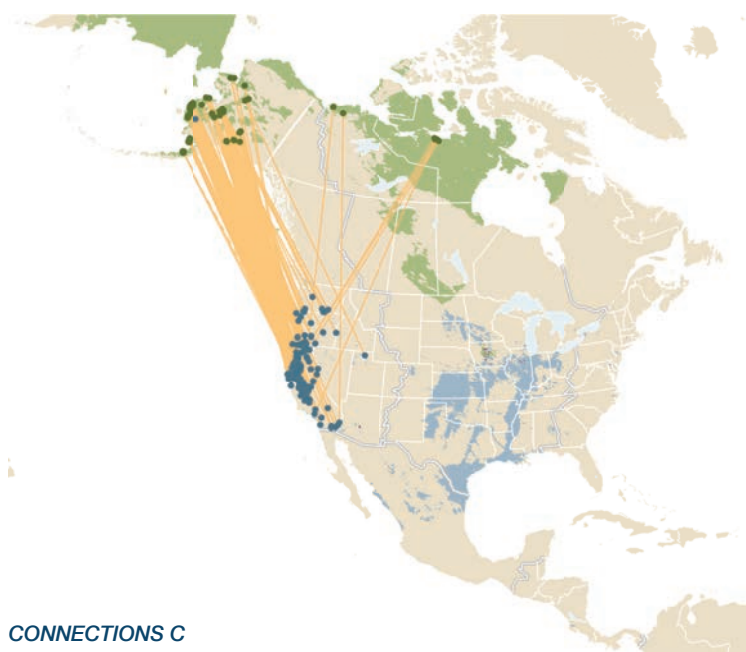
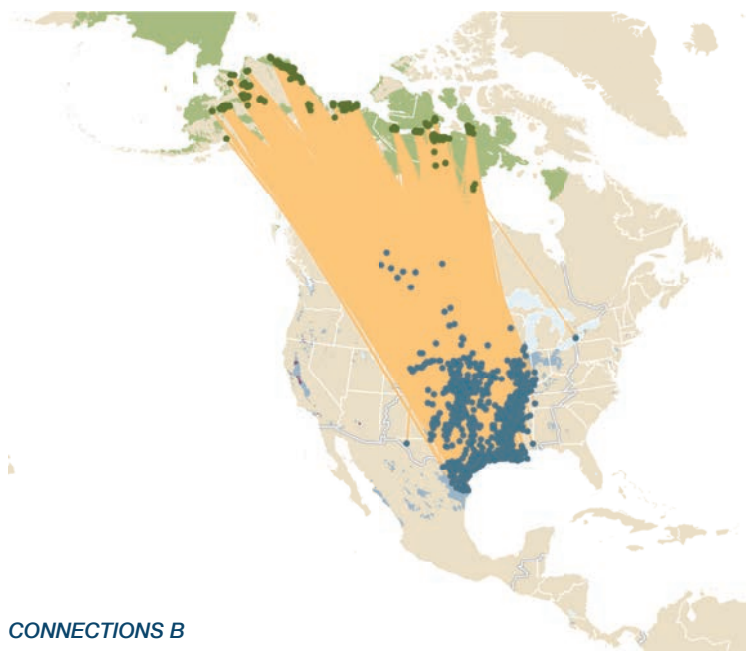
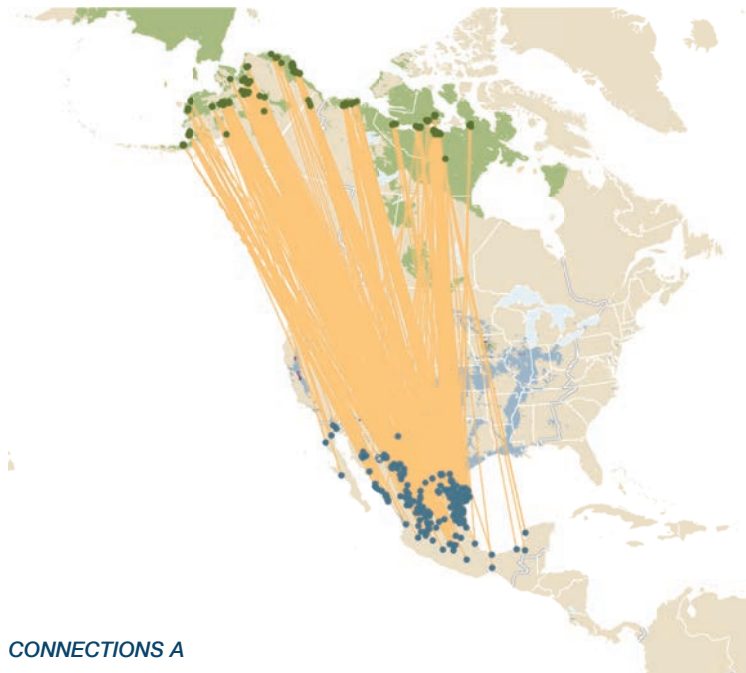
MIGRATORY CONNECTIVITY

OVERALL Banding records, telemetry, and genetics studies all inform migratory connectivity of this species. Greater White-fronted Geese that breed in the Arctic of the Midcontinent Flyway nearly all transition to nonbreeding areas in the same flyway (97%). Birds breeding in the Pacific Flyway transition to the Midcontinent Flyway (58%), Pacific Flyway (27%), and Mexico (14%) during the nonbreeding season, resulting in a weak migratory connectivity (MC = 0.13 ± 0.01).

STABLE ISOTOPES No stable isotope studies of migratory connectivity were found for this species.

GENETICS There was no support for subspecies designations across the global range except for the Tule Greater White-fronted Goose, according to two analyses of mtDNA (Eda et al. 2013; R.E. Wilson et al. 2018). Differences in mtDNA do suggest sparse inter-flyway movement (Eda et al. 2013). At a local scale, mtDNA analysis of birds breeding along the Alaska coast found genetic separation between

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)



the breeding areas of the Pacific Greater White-fronted Goose versus the Tule Greater White-fronted Goose (Ely et al. 2017). There was evidence of some gene flow between the subspecies.

— PACIFIC GREATER WHITE-FRONTED GOOSE *Anser albifrons frontalis*

OVERALL This subspecies is the most widespread in North America. Birds breeding in western Alaska migrate to the Central Valley of California and Mexico, while birds breeding farther east migrate to the midcontinent of the US, along the Gulf Coast and the Mississippi Alluvial Valley.

BANDING Breeding birds banded across the midcontinent were recovered primarily along the Gulf Coast and the Mississippi Alluvial Valley (Moore et al. 2023). There is no geographic variation in recoveries of birds banded in interior Alaska, the Alaska coastal plain, and Arctic Canada (Central Flyway Council et al. 2015). Band resightings of birds marked across Alaska suggest two populations. Coastal Alaska breeding birds migrated to California and Mexico, with birds that bred farther inland remaining farther inland during the nonbreeding season (Ely et al. 2013).

RADIO TRACKING Radio-marked Greater White-fronted Geese ($n = 244$) that bred on the Yukon-Kuskokwim Delta and Bristol Bay Lowlands were both found to use the Klamath Basin during post-breeding migration, then migrated to the Central Valley of California and Mexico for the nonbreeding season (Ely and Takekawa 1996; Ely et al. 2021).

SATELLITE TRACKING Birds marked in the Central Valley of California migrated to breeding areas in western Alaska (US Geological Survey and Canadian Wildlife Service, unpublished data). Greater White-fronted Geese marked in western Arctic Canada and northern Alaska ($n = 20$) migrated to staging areas in southern Alberta and Saskatchewan, then to nonbreeding areas in the lower Mississippi Alluvial Valley and along the Gulf Coast (Askren et al. 2022). The same pattern was seen in five birds marked in eastern Arctic Canada (US Geological Survey and Canadian Wildlife Service, unpublished data).

— TULE GREATER WHITE-FRONTED GOOSE *Anser albifrons gambelli*

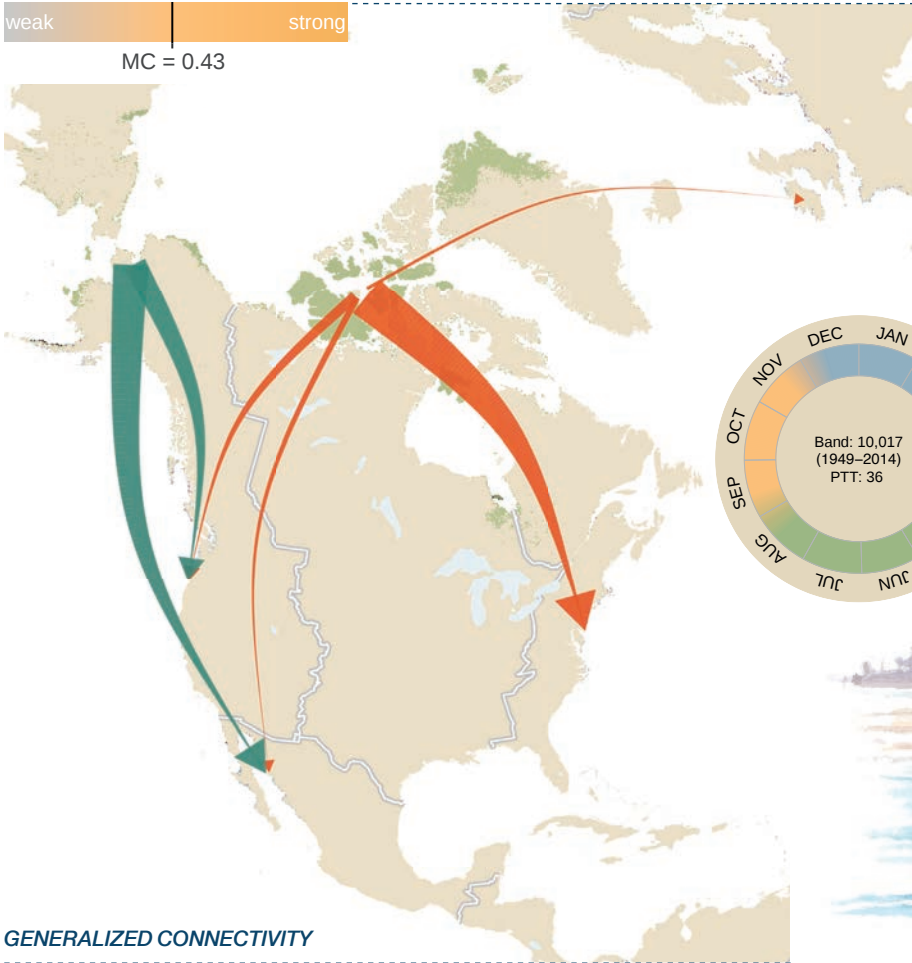
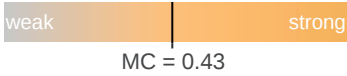
OVERALL Tule Greater White-fronted Geese move between breeding areas around Cook Inlet, Alaska, and nonbreeding areas in the Central Valley of California.

BANDING Tule Greater White-fronted Geese banded on nonbreeding areas in California and breeding areas in Alaska were recovered in the same areas, confirming strong migratory connectivity of this subspecies (Pacific Flyway Council 1991). A small portion (6%) of banded birds were recovered in Texas.

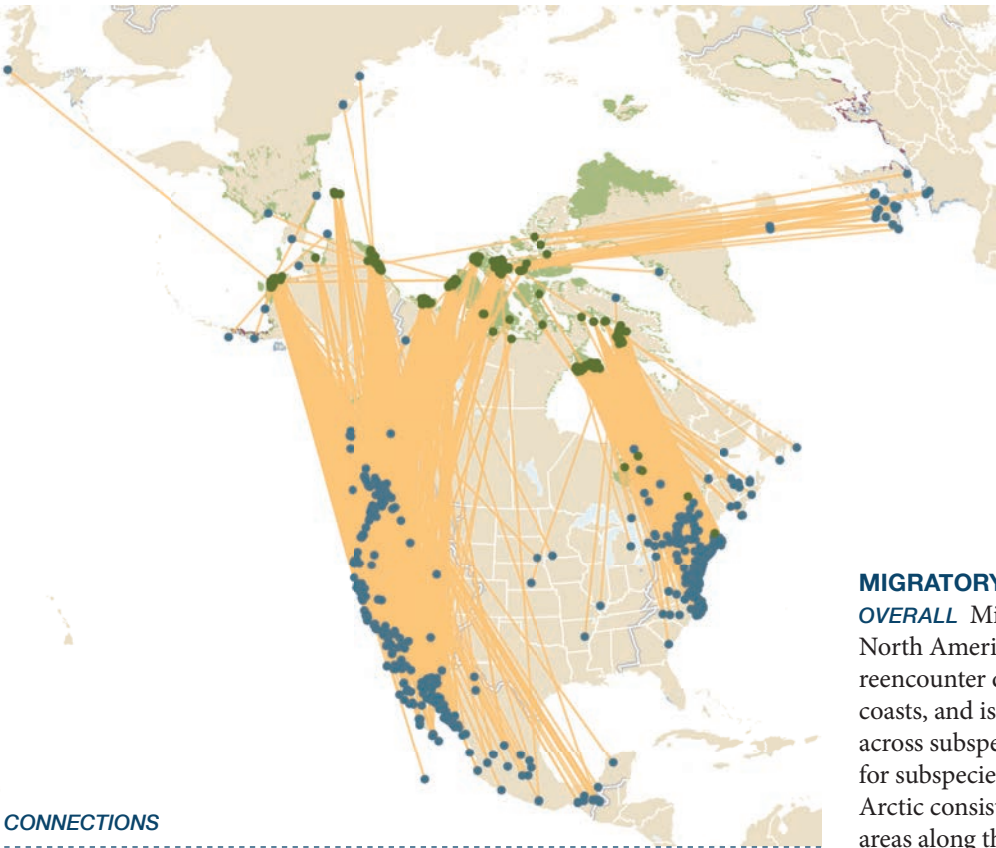
RADIO TRACKING Breeding movements of Tule White-fronted Geese ($n = 90$) found that 50% of birds went through a molt migration to wetlands 400–600 km west of Cook Inlet, but returned before post-breeding migration (Ely et al. 2006).

DATA CONTRIBUTORS

C. Brady; M. Casazza; D.C. Douglas; C. Ely;
B. Meixell; A. Mott; D. Osborne; C. Overton; D. Skalos;
M. Weaver; Canadian Wildlife Service; US Geological Survey.



GENERALIZED CONNECTIVITY



CONNECTIONS

Branta bernicla **BRANT**

DISTRIBUTION AND ABUNDANCE

Brant are found throughout the Northern Hemisphere and include three subspecies, two of which breed in North America. These two subspecies are further divided into four populations. Atlantic Brant are composed of Atlantic Brant and Eastern high Arctic Brant populations. Black Brant are composed of Black Brant and Western High Arctic Brant populations, though the latter is often considered an integrate between the two subspecies. All populations breed in the North American Arctic and migrate to coastal nonbreeding areas as far south as Baja California on the west coast of North America and the mid-Atlantic on the east coast (Lewis et al. 2020).



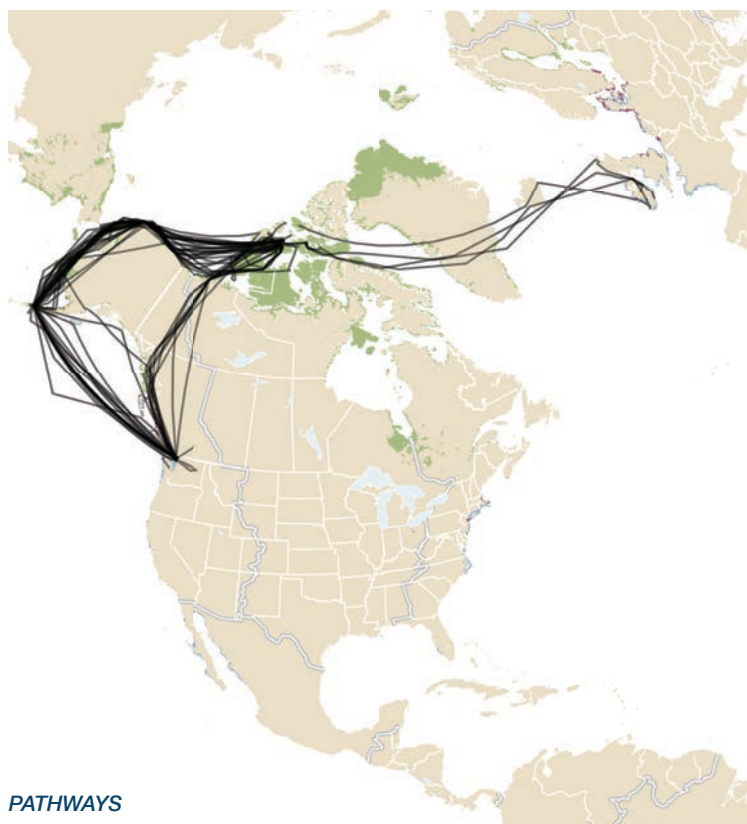
- ORDER Anseriformes
- FAMILY Anatidae
- BREEDING HABITAT Coasts, Salt Marsh
- NONBREEDING HABITAT Coasts, Marine Waters
- GLOBAL POPULATION SIZE 490,000
- POPULATION CHANGE SINCE 1970 +10%
- IUCN RED LIST CATEGORY Least Concern
- R2R TIPPING POINT SPECIES No
- US LISTING STATUS No
- CANADA SPECIES AT RISK No
- PIF CCS 13/20

MIGRATORY CONNECTIVITY

OVERALL Migratory connectivity for the entire species in North America is based on satellite transmitter and band reencounter data of birds from the central Arctic to both coasts, and is strong (MC = 0.43). Migratory connectivity across subspecies also appears strong, but MC is not calculated for subspecies. Brant breeding in Alaska through the central Arctic consist of two populations that migrate to nonbreeding areas along the Pacific coast, from southern British Columbia

	Asia	Atlantic	Europe	Greenland	Mexico	Midcontinent	Pacific	Russia
Midcontinent (n = 5654)	–	77%	1%	<1%	7%	<1%	15%	–
Pacific (n = 3662)	<1%	–	<1%	–	61%	<1%	38	<1%

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)



to Baja California. Movement of breeding birds in the Pacific Flyway is either to Mexico (61%) or within the flyway (38%). Both Atlantic Brant populations breed in the eastern Arctic but have entirely disjunct nonbreeding distributions; the Atlantic Brant population spends the nonbreeding season along the Atlantic coast of North America, while the Eastern High Arctic Brant population migrates to the United Kingdom. Arctic breeding birds in the Midcontinent Flyway primarily spend the nonbreeding season in the Atlantic Flyway (77%), as well as within the Pacific Flyway (15%) and Mexico (7%).

OTHER APPROACHES No genetic or stable isotope studies of migratory connectivity were found for this species.

— ATLANTIC BRANT *Branta bernicla hrota*

ATLANTIC BRANT POPULATION

OVERALL Limited tracking data are available to assess migratory connectivity of nonbreeding Atlantic Brant in North America. Banding data are the primary source of information for this species. Atlantic Brant banded on breeding areas have strong connectivity to the area from Long Island Sound south to the mid-New Jersey coast. Survey data suggest a contraction of the nonbreeding range from much of the mid-Atlantic to areas along the Long Island and New Jersey coasts (Kirby and Obrecht 1982).

BANDING Atlantic Brant have been banded extensively on their breeding areas around the Foxe Basin, Nunavut, Canada, and on nonbreeding areas in the United States. Band recoveries suggest movement between those areas, with no migration to nonbreeding areas of other populations.

RADIO TRACKING Atlantic Brant were marked with radio transmitters ($n = 59$) and located using flights over nonbreeding and breeding areas. Individuals used the same areas as those marked with satellite transmitters (Castelli et al. 2010).

SATELLITE TRACKING Atlantic Brant ($n = 22$) were tracked from nonbreeding areas in the mid-Atlantic states to breeding areas in the Foxe Basin, Nunavut, Canada (Castelli et al. 2010). Migrating birds used western Long Island, New York, and James Bay, as primary staging areas during both pre- and post-breeding migration.

MIGRATORY PATHWAYS Early reports (Lewis 1937) of two migratory pathways between nonbreeding and breeding areas, pieced together from observer accounts, have been confirmed by subsequent satellite tracking data. Atlantic Brant travel from nonbreeding areas either along the coast in a direct route to James Bay, then up the Hudson Bay coast to breeding areas, or along the coast to the mouth of the St. Lawrence River, then west toward Hudson Bay.

EASTERN HIGH ARCTIC BRANT POPULATION

OVERALL This population has been assessed primarily with banding data, with resightings occurring on the primary nonbreeding areas in Europe.

BANDING Band returns show Eastern High Arctic Brant breeders occasionally spending the nonbreeding season with Atlantic Brant in the mid-Atlantic United States.

SATELLITE TRACKING Most tracking studies are of Eastern High Arctic Brant breeding in high Arctic and spending the nonbreeding season in Europe (Robinson et al. 2006). Eastern High Arctic Brant spending the nonbreeding season in Denmark ($n = 33$) were tracked to breeding areas in Greenland, the eastern edge of this population's range (Clausen et al. 2003).

MIGRATORY PATHWAYS North American birds stop over in both Greenland and Iceland en route to nonbreeding areas. From nonbreeding areas, birds stage in Iceland for about one month before returning to breeding grounds (Lewis et al. 2020).

— BLACK BRANT *Branta bernicla nigricans*

BLACK BRANT POPULATION

OVERALL Black Brant migratory connectivity has been well-studied through band reencounter data between breeding, staging, and nonbreeding areas.

BANDING Black Brant banded in southwest Alaska spent the nonbreeding season at sites from British Columbia to Baja California. Sex ratios were similar at all sites, though most juveniles spent the nonbreeding season at more northern locations (Schamber et al. 2007). Brant that were marked at breeding colonies in Alaska, Russia, and Canada were observed at four nonbreeding sites in Baja California and California and showed high fidelity to nonbreeding sites (Lindberg et al. 2007). Alternatively, nonbreeding Black Brant may have weak site fidelity overall, but older age classes have higher site fidelity (Reed et al. 1998). Marked females from breeding grounds in Alaska were resighted at three nonbreeding locations in Baja California, and nonbreeding location had carry-over effects to breeding probability between years (Sedinger et al. 2011).

RADIO TRACKING A project through the Motus Wildlife Tracking System showed no individual breeding to nonbreeding detections but did show one detection from Alaska and one from Baja California, Mexico (Motus project, Black Brant Migration, unpublished data).

MIGRATORY PATHWAYS A particularly important staging area is Izembek Lagoon on the Alaska Peninsula (Purcell and Brodin 2007). Banding reencounter data shows that Humboldt Bay, California, is also an important stopover location for Black Brant migrating from Alaska to nonbreeding areas farther south (Lee et al. 2007).

WESTERN HIGH ARCTIC BRANT POPULATION

OVERALL This population breeds farther east than the Black Brant population. There is weak migratory connectivity between the two populations.

BANDING A combination of band recoveries and analysis of plumage differences between the two populations suggested that most individuals spending the nonbreeding season in Padilla Bay, Washington, were from the Western High Arctic population (Reed et al. 1989a).

SATELLITE TRACKING Birds breeding on Melville Island, Canada,

were tracked with satellite transmitters along a coastal route around Alaska, to nonbreeding sites in Padilla Bay and Samish Bay (of the Salish Sea) near Puget Sound, Washington (Boyd et al. 2013). **MIGRATORY PATHWAYS** Western High Arctic Brant travel from breeding areas in the high Arctic, primarily along the Alaska coast, south to nonbreeding areas in the Salish Sea. Whether they spend the nonbreeding season at Izembek or continue on to Baja California

may depend on weather conditions and food availability during staging (Purcell and Brodin 2007). Izembek Lagoon on the Alaska Peninsula is an important post-breeding staging area (Reed et al. 1989b; Boyd et al. 2013). Radio telemetry data showed 80% of 33 radio-marked adult Western High Arctic Brant from four separate breeding areas of the Canadian Arctic and one area in Alaska used this stopover location (Reed et al. 1989a).

DATA CONTRIBUTORS

W.S. Boyd; J. Evenson; K. Spragens; M. Wilson.

INTERESTING NOTE

Color-banded individuals from Alaska and western Canada have been resighted at staging and nonbreeding sites throughout Japan (Derksen et al. 1996).

weak | strong
MC = 0.18 ± 0.11*



Branta hutchinsii **ACKLING GOOSE**

DISTRIBUTION AND ABUNDANCE

Cackling Geese breed across the North American coastal Arctic and subarctic tundra. They migrate to nonbreeding areas primarily in the western United States and southern Great Plains states (Mowbray et al. 2020b). Four subspecies of Cackling Goose are recognized (listed by primary breeding area, from west to east); Aleutian, Minima, Taverner's, and Richardson's.

ORDER Anseriformes

FAMILY Anatidae

BREEDING HABITAT Wetlands, Tundra

NONBREEDING HABITAT Wetlands, Generalist

GLOBAL POPULATION SIZE 4,500,000

POPULATION CHANGE SINCE 1970: +946%

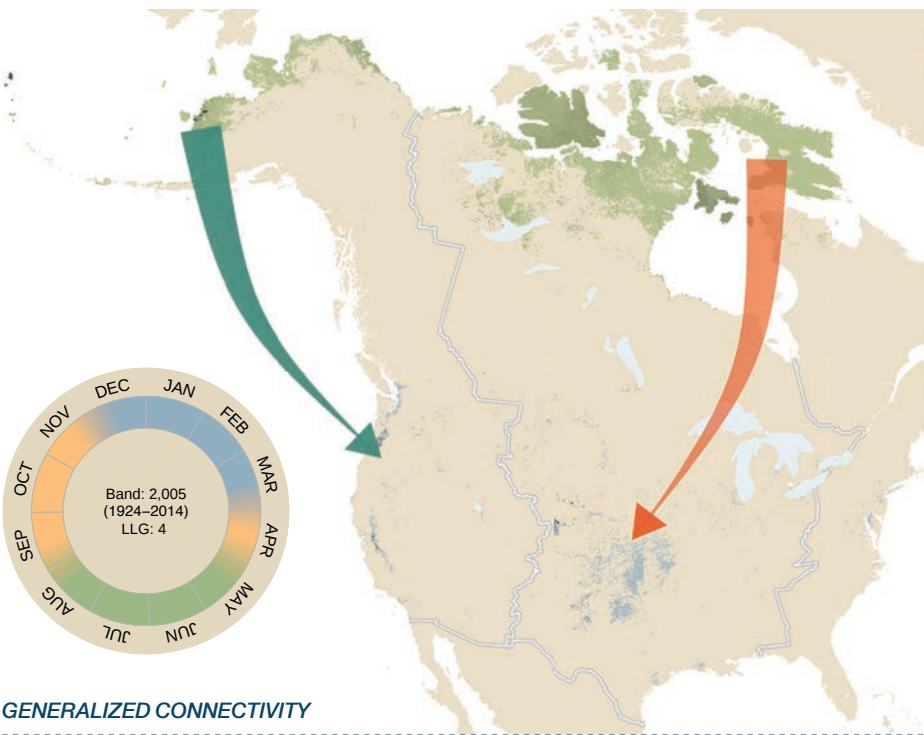
IUCN RED LIST CATEGORY Least Concern

R2R TIPPING POINT SPECIES No

US LISTING STATUS No

CANADA SPECIES AT RISK No

PIF CCS 10/20



GENERALIZED CONNECTIVITY

	Mexico	Midcontinent	Pacific
Midcontinent (n = 4)	–	100%	–
Pacific (n = 1638)	<1%	<1%	100%

MIGRATORY CONNECTIVITY

OVERALL In 2004, the American Ornithologists Union (AOU) recognized Cackling Goose as a separate species from Canada Goose, and despite the vast research on the latter species, migratory connectivity data is relatively limited for the four subspecies of Cackling Goose but suggests limited cross-flyway movement of subspecies and weak migratory connectivity across the species (MC = 0.18 ± 0.11).

BANDING Banding and neck-collar resight efforts are primarily conducted to inform population boundaries and management actions (Mississippi Flyway Council 2013; Pacific Flyway Council 2016); however, data also show a latitudinal correspondence between breeding and nonbreeding areas.

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

— ALEUTIAN CACKLING GOOSE

Branta hutchinsii leucopareia

OVERALL The Aleutian Cackling Goose population has recovered from fewer than 400 birds in the 1960s. They breed on many Aleutian Islands and the Alaska Peninsula and spend the nonbreeding season primarily in central California (Baldassarre 2014). During migration, they use sites along coastal Oregon and California, including Humboldt Bay (Mini et al. 2011).

GENETICS Canada and Cackling Geese have been sampled across their breeding range in Alaska, and Aleutian Cackling Geese nesting among various islands were more closely related to each other than to those nesting in mainland Alaska, based on molecular genetics (Pierson et al. 2000).

— MINIMA CACKLING GOOSE

Branta hutchinsii minima

OVERALL Minima Cackling Geese breed exclusively on the Yukon-Kuskokwim Delta in Alaska, generally in more coastal areas than do Taverner's Cackling Geese. They migrate to nonbreeding areas in the lower Columbia River Valley and the Willamette Valley of Oregon (Pacific Flyway Council 2016).

BANDING Minima Cackling Geese banded and marked with neck collars on staging areas had high fidelity to staging areas in the northern Alaska Peninsula and nonbreeding areas in Washington and Oregon (Pacific Flyway Council 2016).

— TAVERNER'S CACKLING GOOSE

Branta hutchinsii taverneri

OVERALL Taverner's Cackling Geese breed in the tundra areas of the North Slope and western Alaska and migrate to nonbreeding areas in western Oregon and Washington, as well as the midcontinent of the United States.

BANDING Banding in the 1920s near Tule Lake, Alaska, (n = 250) resulted in 39 recoveries in Washington, Oregon, and Sacramento Valley, California (Lincoln 1926). Later work with neck collars on staging areas in Alaska resulted in resightings in the Columbia River Valley, though some birds were observed as far south as the Central Valley of California (Eichholz and Sedinger 2006).

SATELLITE TRACKING Unpublished satellite telemetry data from birds nesting on the North Slope in Alaska show migration to the midcontinent US (C. Latty, US Fish and Wildlife Service, unpublished data).

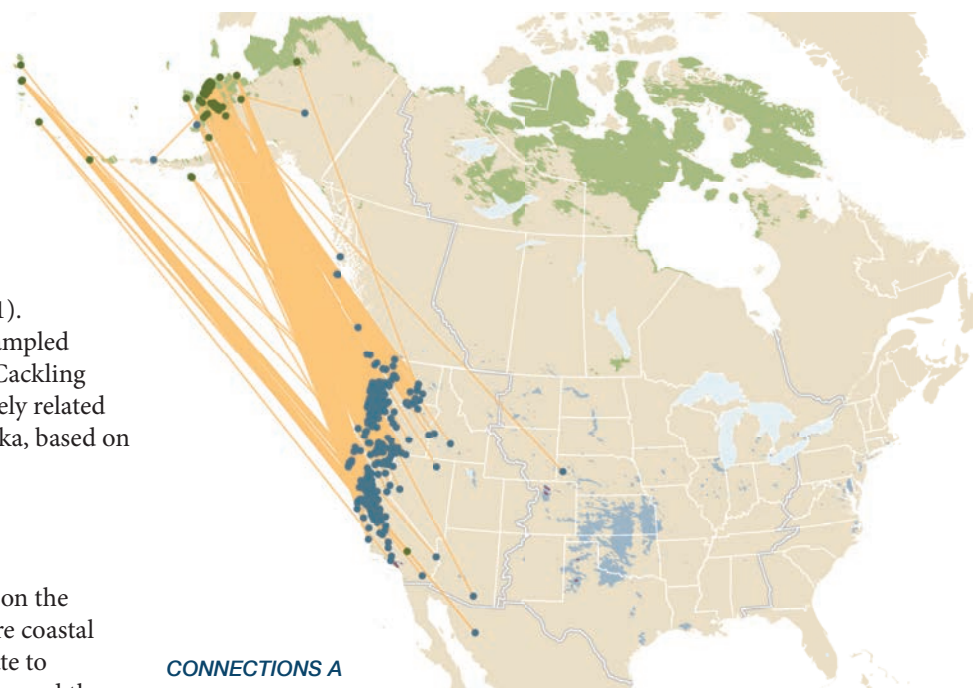
— RICHARDSON'S CACKLING GOOSE

Branta hutchinsii hutchinsii

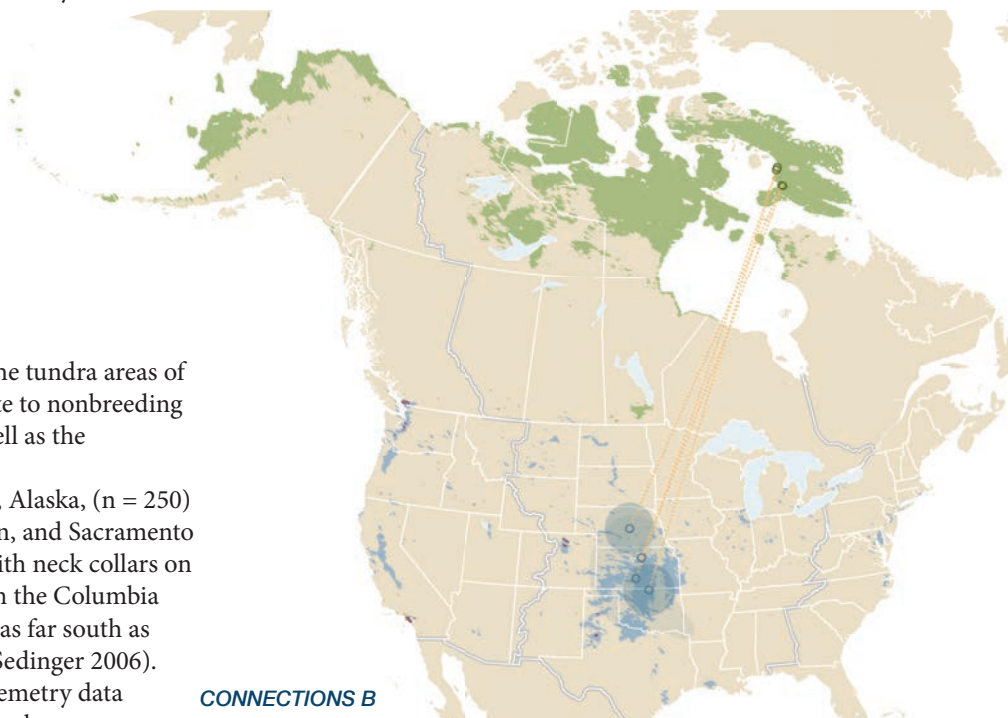
OVERALL Richardson's Cackling Geese breed in the high Arctic from the Mackenzie River delta east to Baffin and Southampton islands (Baldassarre 2014) and spend the nonbreeding season in the interior United States, particularly in Kansas, Oklahoma, and western Texas.

DATA CONTRIBUTORS

F. Baldwin; K.C. Fraser; L. Neufeld.



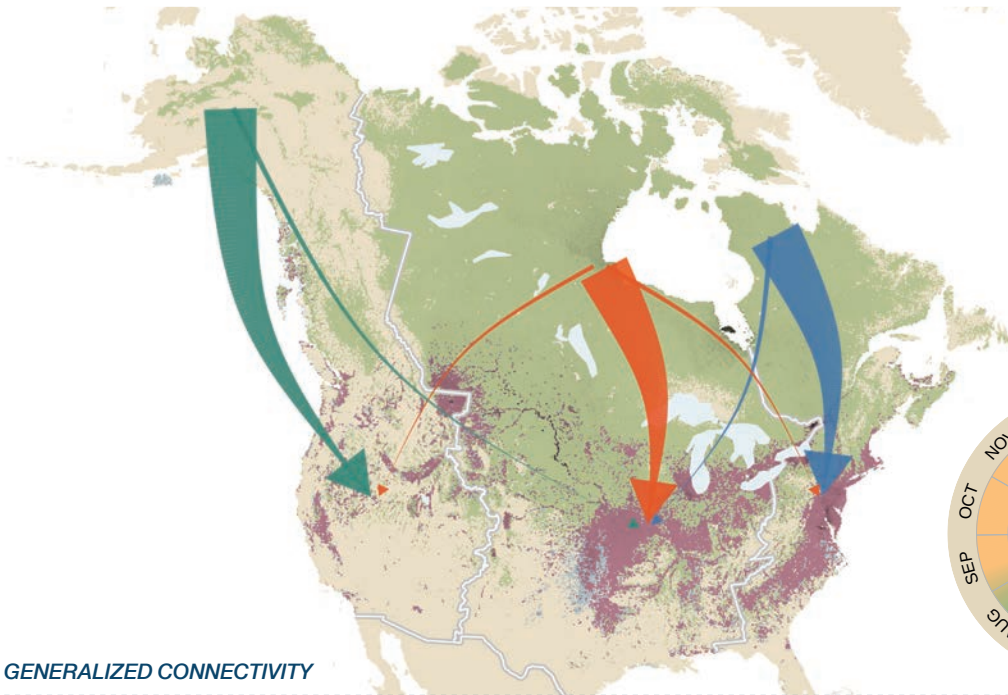
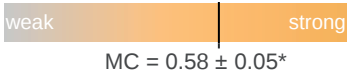
CONNECTIONS A



CONNECTIONS B

BANDING Banding data show movements from breeding areas across the high Arctic to nonbreeding areas in the shortgrass prairie of the central United States, particularly the panhandle of Texas (Hines et al. 2000).

SATELLITE TRACKING Recent tracking of Richardson's Cackling Geese breeding on Southampton and Baffin islands show migration to nonbreeding areas in the United States (F. Baldwin, Canadian Wildlife Service, unpublished data).



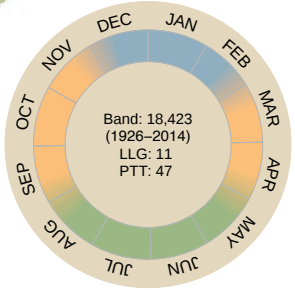
Branta canadensis

CANADA GOOSE

DISTRIBUTION AND ABUNDANCE

The Canada Goose is widespread in North America, with the breeding range spanning Canada and the continental United States, and the nonbreeding range spanning the continental United States where open water is available (Mowbray et al. 2020c). After large declines in population size in the early 1900s and subsequent introductions of populations, Canada Geese are now abundant and breed in areas not occupied by pre-European settlements.

There are currently seven subspecies recognized (listed by primary breeding area, from west to east): Dusky, Vancouver, Western, Lesser, Interior, Giant, and Atlantic.



GENERALIZED CONNECTIVITY

ORDER Anseriformes
FAMILY Anatidae
BREEDING HABITAT Wetlands, Generalist
NONBREEDING HABITAT Wetlands, Generalist
GLOBAL POPULATION SIZE 7,600,000
POPULATION CHANGE SINCE 1970 +100%
IUCN RED LIST CATEGORY Least Concern
R2R TIPPING POINT SPECIES No
US LISTING STATUS No
CANADA SPECIES AT RISK No
PIF CCS 6/20

	Atlantic	Mexico	Midcontinent	Pacific
Atlantic (n = 1457)	95%	—	5%	<1%
Midcontinent (n = 14185)	4%	<1%	93%	3%
Pacific (n = 2073)	—	<1%	5%	94%

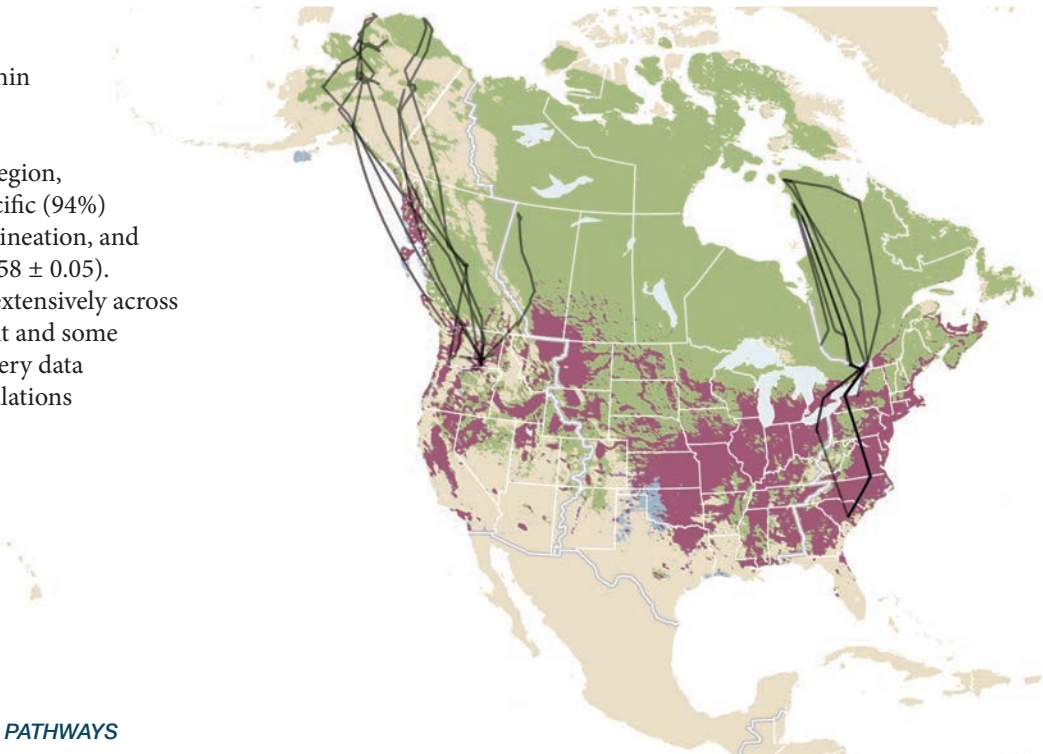


MIGRATORY CONNECTIVITY

OVERALL Strong migratory connectivity within subspecies and populations, as well as within flyways. There is high transition probability within the same breeding and nonbreeding region, Atlantic (95%), Midcontinent (93%), and Pacific (94%) flyways, which coincides with population delineation, and thus strong migratory connectivity (MC = 0.58 ± 0.05).

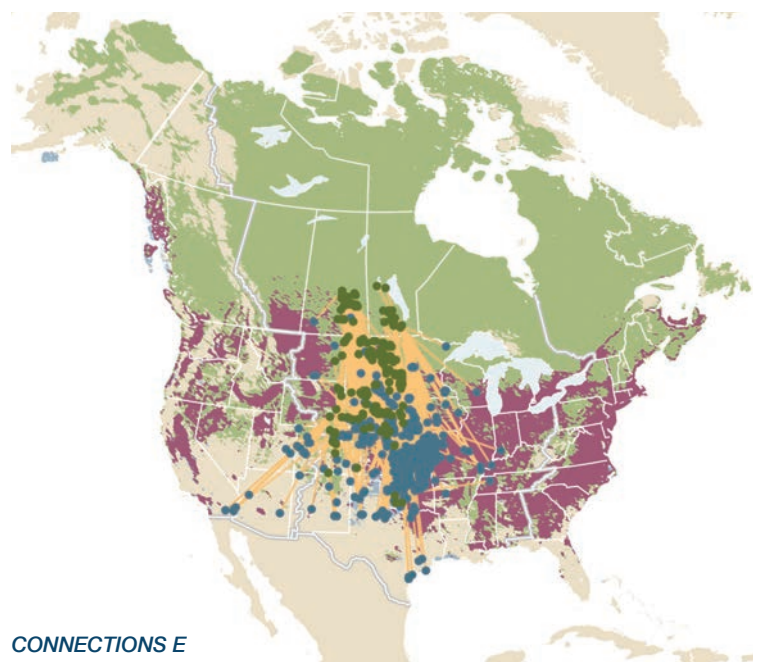
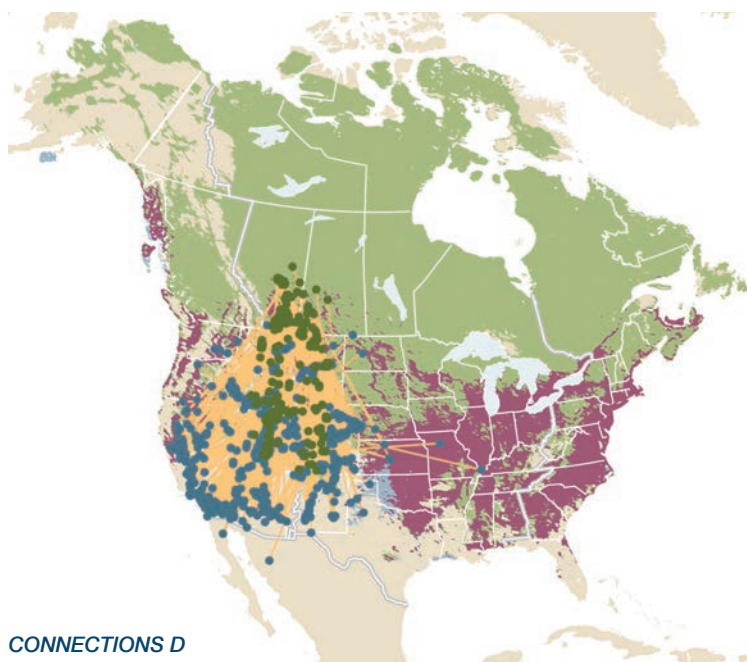
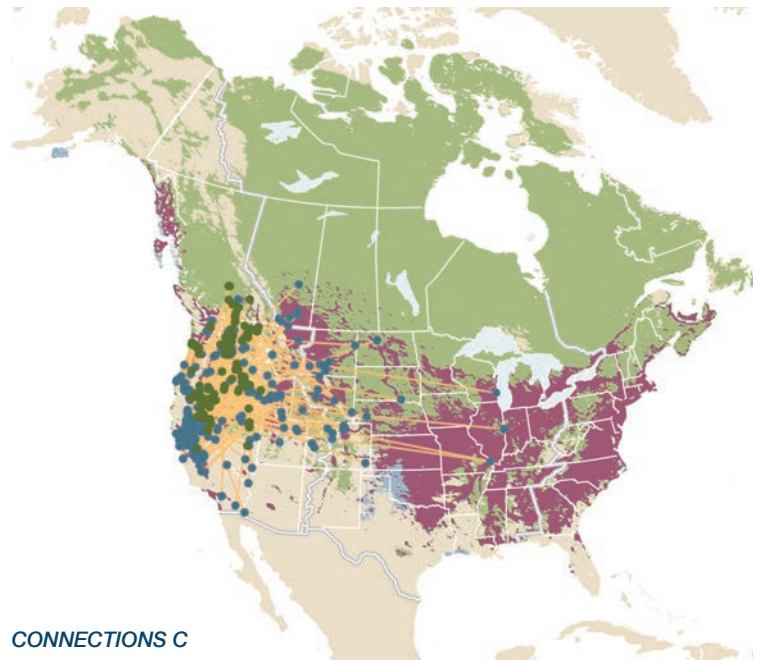
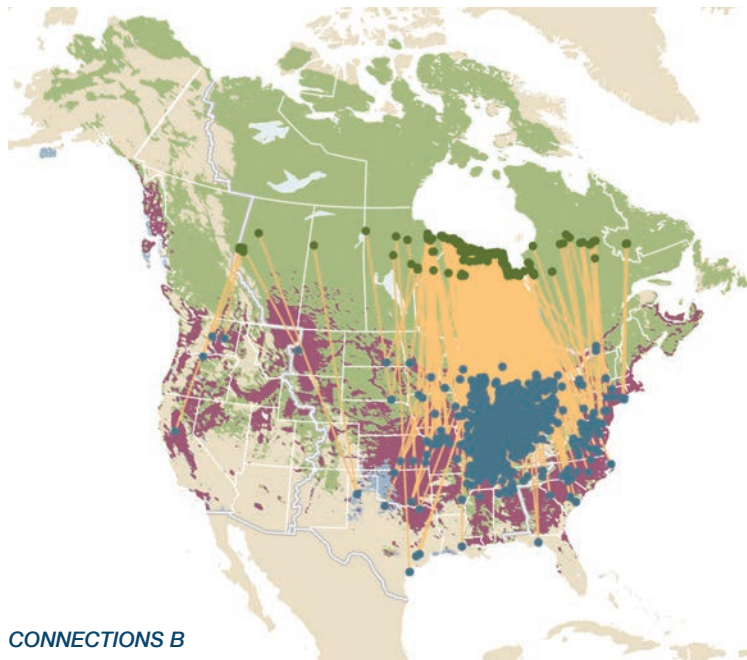
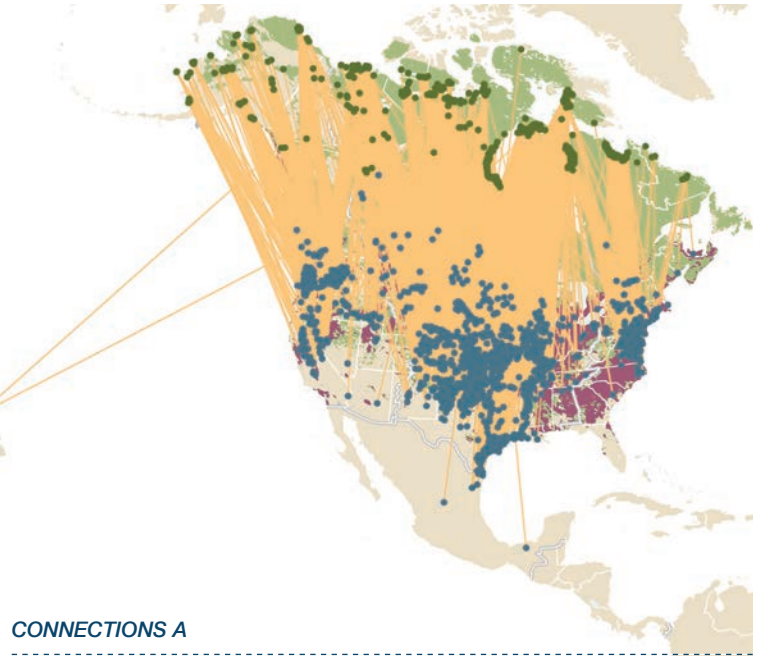
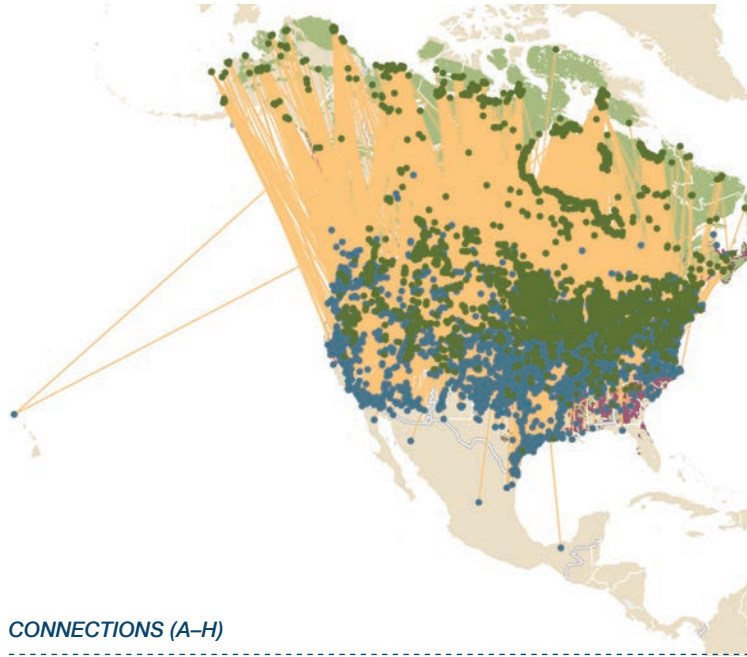
BANDING Canada Geese have been banded extensively across North America; some individuals are resident and some are migratory. An analysis of band and recovery data across North America showed multiple populations with narrow north-south migration routes, except in the southeastern United States, where communities were spatially isolated and generally nonmigratory (Buhnerkempe et al. 2016).

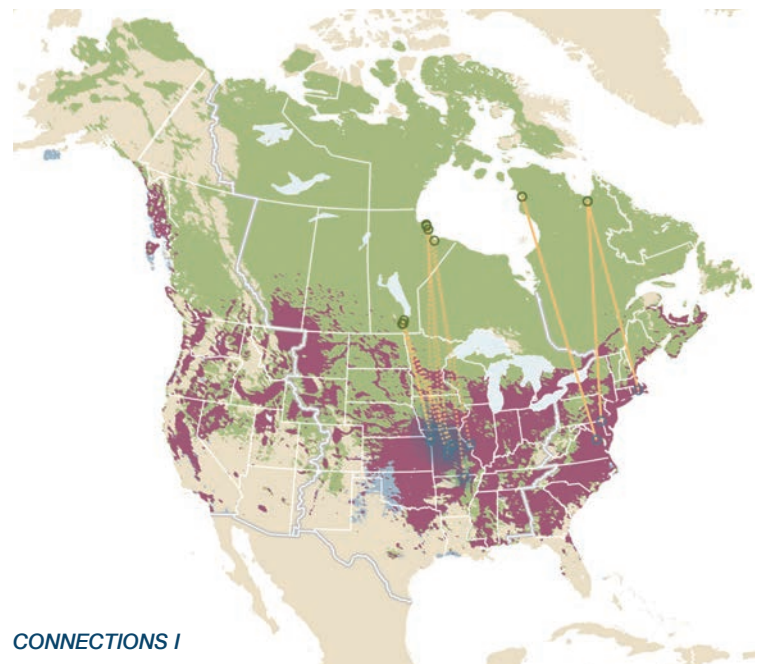
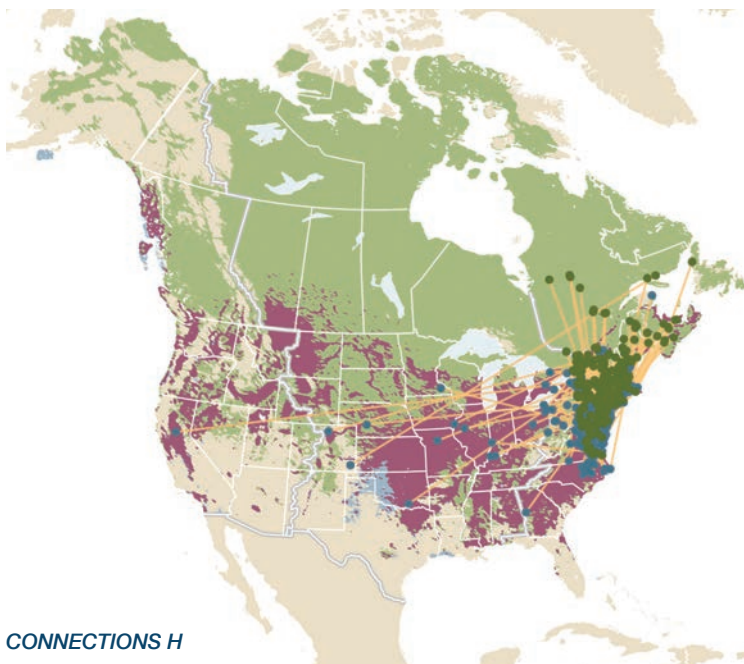
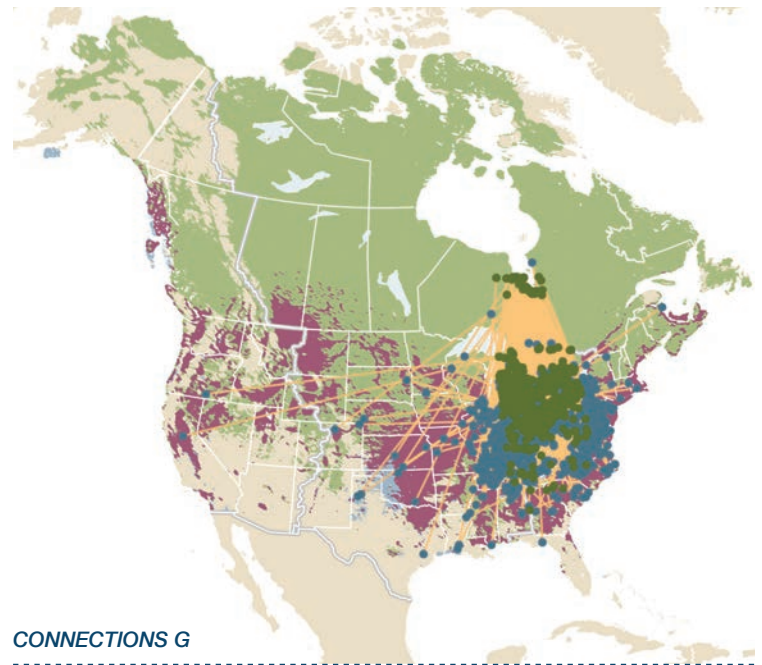
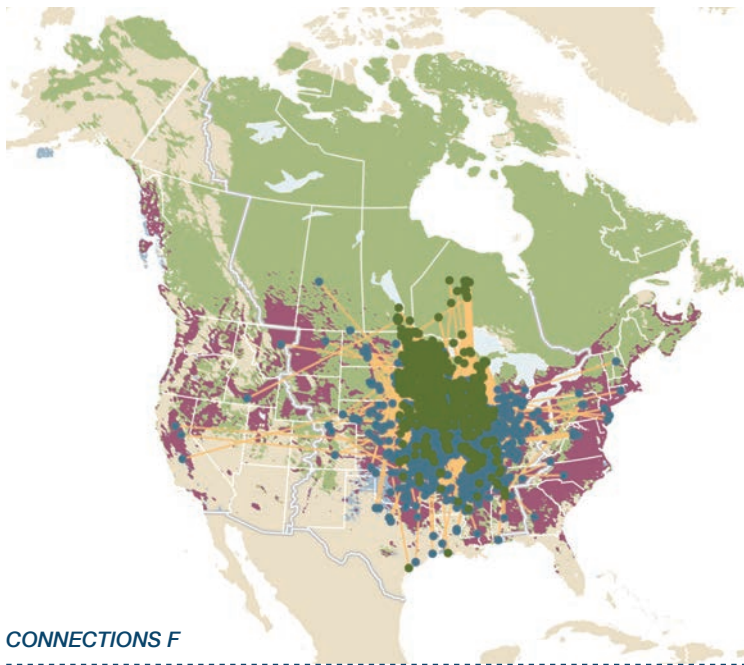
RADIO TRACKING Over 200 tags were deployed using the Motus Wildlife Tracking System. Detections occur throughout the range; yet there have been no individual breeding to nonbreeding detections.



PATHWAYS

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)





— DUSKY CANADA GOOSE

Branta canadensis occidentalis

OVERALL Dusky Canada Geese breed on the Copper River Delta in Alaska and migrate along the Pacific coast to nonbreeding areas in western Washington and Oregon (Pacific Flyway Council 2015). Nonbreeding birds are concentrated in the lower Columbia River Valley and the Willamette Valley, where Dusky Canada Geese occur with 6 other subspecies of Canada Goose and Cackling Goose (Baldassarre 2014).

GENETICS Analysis of three classes of genetic markers questions the separation of Dusky Canada Geese from other coastal Alaskan breeding subspecies (Talbot et al. 2003).

— VANCOUVER CANADA GOOSE

Branta canadensis fulva

OVERALL Vancouver Canada Geese occur year-round in temperate rain forests of southeast Alaska and British Columbia. Very few individuals migrate south to coastal Oregon.

BANDING Birds banded in Vancouver, British Columbia, were nearly all (92%) recovered in the same area (Baldassarre 2014). About 2% of Vancouver Canada Geese banded in the Nimpkish Valley, British Columbia, were subsequently recovered in the Willamette Valley, Oregon.

RADIO TRACKING Breeding and nonbreeding Vancouver Canada Geese ($n = 166$) were implanted with transmitters during breeding and post-breeding (Hupp et al. 2010). Most (70%) birds moved <30 km, and none migrated to coastal British Columbia or western Oregon or Washington.

— WESTERN CANADA GOOSE

Branta canadensis moffitti

OVERALL Western Canada Geese breed throughout the Great Basin of the western United States and in southwestern Canada (Baldassarre 2014). They are widespread and only partial migrants. Birds may be year-round residents or migrate south seeking open water.

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

— LESSER CANADA GOOSE

Branta canadensis parvipes

OVERALL Lesser Canada Geese breed from interior Alaska east across tundra and taiga vegetation communities to the western shore of Hudson Bay. They migrate to nonbreeding areas across Washington and Oregon, as well as the central Great Plains (Baldassarre 2014).

BANDING Lesser Canada Geese banded and marked with neck collars ($n = 884$) on staging areas in interior Alaska migrated to Washington and Oregon (Eichholz and Sedinger 2006).

— INTERIOR CANADA GOOSE

Branta canadensis interior

OVERALL Interior Canada Geese spend the breeding and nonbreeding season throughout central and eastern Canada and the United States, with some migratory populations breeding in subarctic areas, principally along Hudson Bay and the Ungava Peninsula. This subspecies is managed as a number of population units based on breeding concentrations (Mississippi Flyway Council 2017). Many populations are relatively short-distance migrants, only going south to reach open water.

BANDING Interior Canada Geese marked with neck collars at Hudson and James bays, Canada, were observed primarily in Wisconsin and Illinois during the nonbreeding season (Craven and Rusch 1983). Individuals banded along the western shore of Hudson Bay were recovered in the Mississippi Valley and eastern Great Plains of the United States (Vaught and Arthur 1965). Birds banded during the breeding season in the Midcontinent Flyway (84%; Mississippi Flyway—80%, Central Flyway—4%), the Atlantic Flyway (3%), and Canada (13%) were recaptured in coastal areas of James Bay and Hudson Bay after a molt migration (Abraham et al. 1999).

RADIO TRACKING Interior Canada Geese marked during breeding in Ontario migrated along the Mississippi River floodplain to nonbreeding areas in the Mississippi Alluvial Valley (Tacha et al. 1991).

SATELLITE TRACKING Female Interior Canada Geese, representing the Atlantic population, fitted with transmitters ($n = 34$) on breeding areas on the Ungava Peninsula, Quebec, were tracked to nonbreeding areas on the Atlantic coast around Chesapeake and Delaware bays (Malecki et al. 2001). Females marked in New York and Pennsylvania with unsuccessful nests performed a northward molt migration to areas around Hudson Bay (Sheaffer et al. 2007). Interior Canada Geese spending the nonbreeding season in eastern South Carolina ($n = 8$) were tracked with satellite transmitters north to breeding areas on the Ungava Peninsula (Giles et al. 2013), and birds marked with satellite transmitters in Greenland migrated through the Ungava Peninsula (Scribner et al. 2003).

GENETICS Populations of two subspecies of Canada Geese (*B. c. interior* and *B. c. maxima*) sampled across Ontario and Quebec had little genetic differentiation, except for high relatedness at fine-scale spatial distances (Finnegan et al. 2013). Nuclear DNA markers and mtDNA from Canada Geese sampled in the Ungava Peninsula, Labrador, and Greenland suggest Greenland breeding birds may be more closely related to *B. c. interior* than *B. c. canadensis* (Scribner et al. 2003).

— GIANT CANADA GOOSE

Branta canadensis maxima

OVERALL Giant Canada Geese are the largest geese in the world and are the common breeding subspecies in the eastern half of the United States. Most birds in the eastern United States are a result of intentional introductions of this subspecies and are only partial

migrants. Molt migrations often occur to Canada from breeding areas farther south (Mississippi Flyway Council 2017).

BANDING Giant Canada Geese originating from nonbreeding areas in Missouri, Arkansas, Louisiana, Illinois, and Ohio underwent a molt migration to the west coast of Hudson Bay (Davis et al. 1985). Individuals captured in the molting period on the breeding grounds in eastern South Dakota underwent molt migrations within and north of South Dakota (Dieter and Anderson 2009). The majority (80%) of band recoveries of individuals banded in Ohio between 1990 and 2015 were from Ohio, with fewer recoveries in the Mississippi and Atlantic flyways (Shirkey et al. 2018).

RADIO TRACKING The population of geese that nest in lakes in Manitoba, Canada, and migrate to Rochester, Minnesota, were studied with neck collars and radio transmitters and generally flew directly between main breeding and nonbreeding areas (Wege and Raveling 1983).

SATELLITE TRACKING Females ($n = 227$) tracked from their nests in southern Michigan migrated >900 km to molting locations in the western Ungava Peninsula, Cape Henrietta Maria, James Bay, and Hudson Bay. After molt migration, females returned to their nesting areas in the fall (Luukkonen et al. 2008).

STABLE ISOTOPES Populations of Canada Geese near New Jersey and Ungava Bay, Canada, were sampled for stable isotopes to determine whether they were migratory (*B. c. interior*) or resident (*B. c. maxima*). Stable isotopes were able to distinguish populations in Canada as migratory and in New Jersey as residents (Caccamise et al. 2000).

— ATLANTIC CANADA GOOSE

Branta canadensis canadensis

OVERALL Atlantic Canada Geese breed in eastern Quebec, the Maritime provinces, and Greenland. They primarily migrate to nonbreeding areas in southern New England and Long Island, New York, though can be found from Nova Scotia south to North Carolina (Baldassarre 2014).

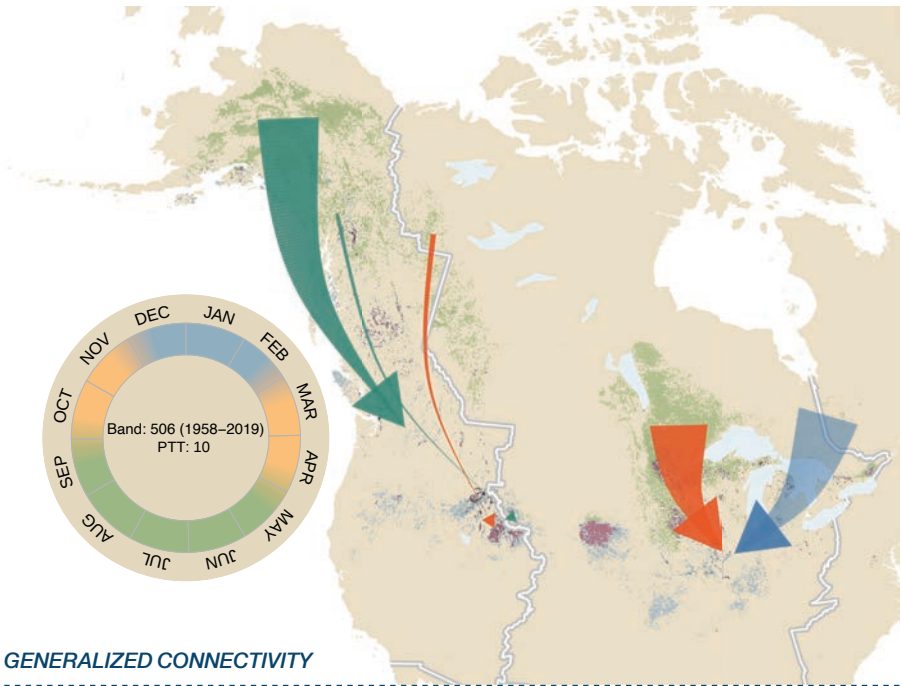
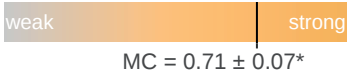
BANDING Atlantic Canada Geese marked with bands and neck collars on breeding areas were observed mostly in New England (77%) and the remainder in the mid-Atlantic states. Analyses of neck-collar and band resightings confirmed migration from Atlantic Canada to New England states, and the proportion of birds moving to more southern nonbreeding areas has diminished (Bateman and Daury 1994). Recoveries of Atlantic Canada Geese in Delaware, Maryland, Virginia, and North Carolina declined from 30% of recoveries in 1920–1986 to only 6% in 1987–1995 (Hestbeck and Bateman 2000). Birds marked in western Greenland ($n = 135$) were recovered during post-breeding migration in Labrador and New Brunswick and during the nonbreeding season in Connecticut, New York, and Pennsylvania (Kristiansen et al. 1999). Newfoundland breeding birds may be more likely to remain within Canada during the nonbreeding season than those breeding in Labrador (Atlantic Flyway Council 2008).

RADIO TRACKING Four Atlantic Canada Geese radio-marked in Greenland all migrated to western Long Island before moving to the Chesapeake Bay area in late January (Atlantic Flyway Council 2008).

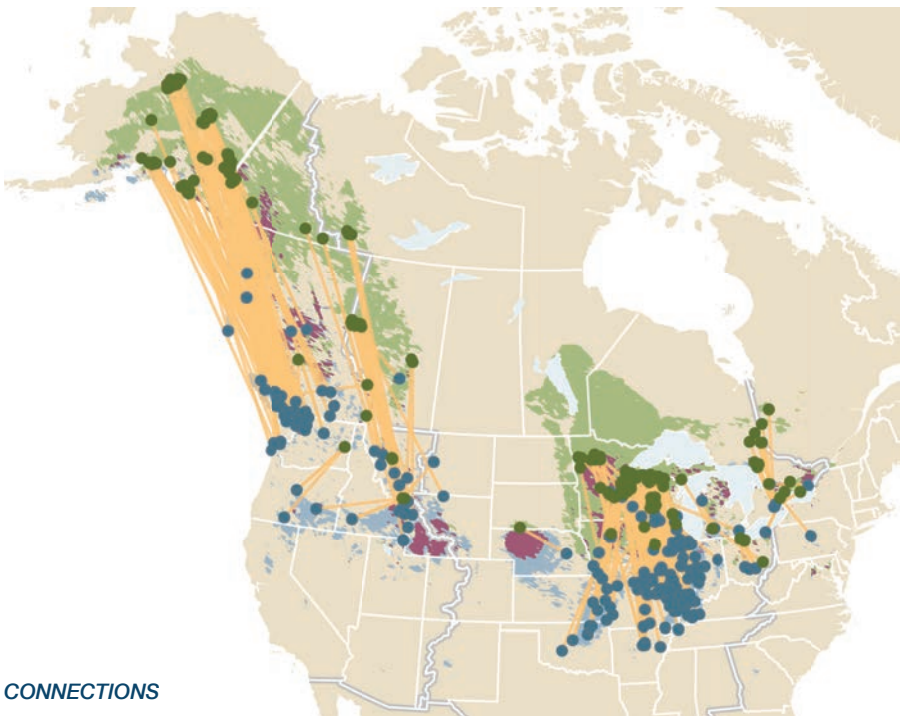
SATELLITE TRACKING Birds marked with satellite transmitters in Greenland migrated through the Ungava Peninsula, and these movements, in association with genetic evidence, suggest Greenland breeding birds may be more closely related to *B. c. interior* (Scribner et al. 2003). Atlantic Canada Geese captured in coastal North Carolina and equipped with satellite transmitters migrated to breeding areas in southern Labrador (Atlantic Flyway Council 2008).

DATA CONTRIBUTORS

F. Baldwin; J. Evenson; K.C. Fraser; M. Giles; L. Neufeld; K. Spragens; M. Wilson; Clemson University; South Carolina Cooperative Fish and Wildlife Research Unit; South Carolina Department of Natural Resources; US Fish and Wildlife Service.



GENERALIZED CONNECTIVITY



CONNECTIONS

MIGRATORY CONNECTIVITY

OVERALL Banding and satellite tracking data, along with reintroduction efforts, confirm strong migratory connectivity (Mitchell and Eichholz 2020). Transition rates within the same breeding and nonbreeding flyway are high (95%–100%) across most breeding populations, with little overlap. This geographic separation results in strong migratory connectivity ($MC = 0.71 \pm 0.07$) and the strongest MC of all species within the Anseriformes.

BANDING Trumpeter Swans banded on breeding areas on the Copper River Delta, Alaska, were resighted most frequently on nonbreeding grounds on Vancouver Island, British Columbia, though some also migrated to Idaho and Montana (Bailey et al. 1990; Sladen and Whissel 2007). Birds banded at Cook Inlet, Alaska, spent the nonbreeding season in the Skagit Valley, Washington (Sladen and Whissel 2007). Trumpeter Swans that breed in interior British Columbia, Alberta, and

Saskatchewan migrate to the Greater Yellowstone Ecosystem or the Great Plains for the nonbreeding season (Mackay 1957).

SATELLITE TRACKING Individuals ($n = 8$) tagged in Alaska all migrated south along the Rocky Mountains to nonbreeding areas in the Pacific Northwest (Dallin 2004; Lance and Mallek 2004). Six breeding males marked at Red Rock Lakes National Wildlife Refuge, Montana, stayed locally or within the Greater Yellowstone Ecosystem during the nonbreeding season (Olson et al. 2009). Trumpeter Swans ($n = 16$) marked in Wisconsin during the breeding season migrated within the same state or to neighboring states, with a maximum migration distance of birds breeding west of the Great Lakes of <1,000 km (Diebold et al. 2008).

GENETICS Early genetic evidence (nuclear DNA) suggested no differences between populations at the three breeding areas (Barrett and Vyse 1982). However, more recent genetic analysis of Trumpeter

Cygnus buccinator

TRUMPETER SWAN

DISTRIBUTION AND ABUNDANCE

There are three geographically distinct populations of Trumpeter Swans. Birds breeding in Alaska spend the nonbreeding season near the Pacific coast with concentrations in southeast Alaska. Birds breeding in the Rocky Mountains of western Canada and north-central US migrate to nonbreeding areas in the Greater Yellowstone Ecosystem, where ice-free conditions exist, or in Rocky Mountain states farther south (Gale et al. 1987). Individuals that breed in central North America have a large breeding and nonbreeding range in the eastern United States.



ORDER Anseriformes

FAMILY Anatidae

BREEDING HABITAT Wetlands, Lakes, and Rivers

NONBREEDING HABITAT Wetlands, Generalist

GLOBAL POPULATION SIZE 63,000

POPULATION CHANGE SINCE 1970 +1663%

IUCN RED LIST CATEGORY Least Concern

R2R TIPPING POINT SPECIES No

US LISTING STATUS No

CANADA SPECIES AT RISK No

PIF CCS 11/20

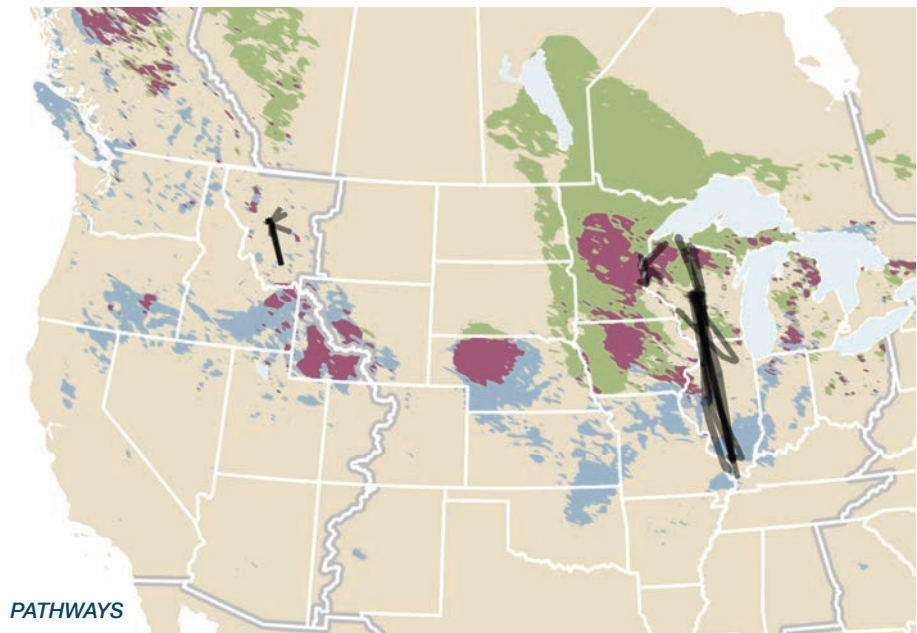
	Atlantic	Midcontinent	Pacific
Atlantic ($n = 2$)	–	100%	–
Midcontinent ($n = 374$)	<1%	95%	4%
Pacific ($n = 137$)	–	1%	99%

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

Swans from the Pacific Flyway and interior Rocky Mountain populations shows strong genetic differentiation between those populations (Oyler-McCance et al. 2007). Genetic data also confirm that each population experienced a genetic bottleneck during periods of low population abundance and prior to restoration efforts. The interior population is derived from individuals of both western populations, so it is genetically similar to each (Baldassarre 2014). **MIGRATORY PATHWAYS** Trumpeter Swans in the eastern two populations are short-distance migrants, if they migrate at all. Birds marked with satellite telemetry appear to migrate in a fairly direct path between breeding and nonbreeding areas, where long-distance migration occurs.

DATA CONTRIBUTORS

E. Caton; E. Diebold; C. Koontz; F. Koontz; P. Manthey; S. Matteson; G. Neudecker.



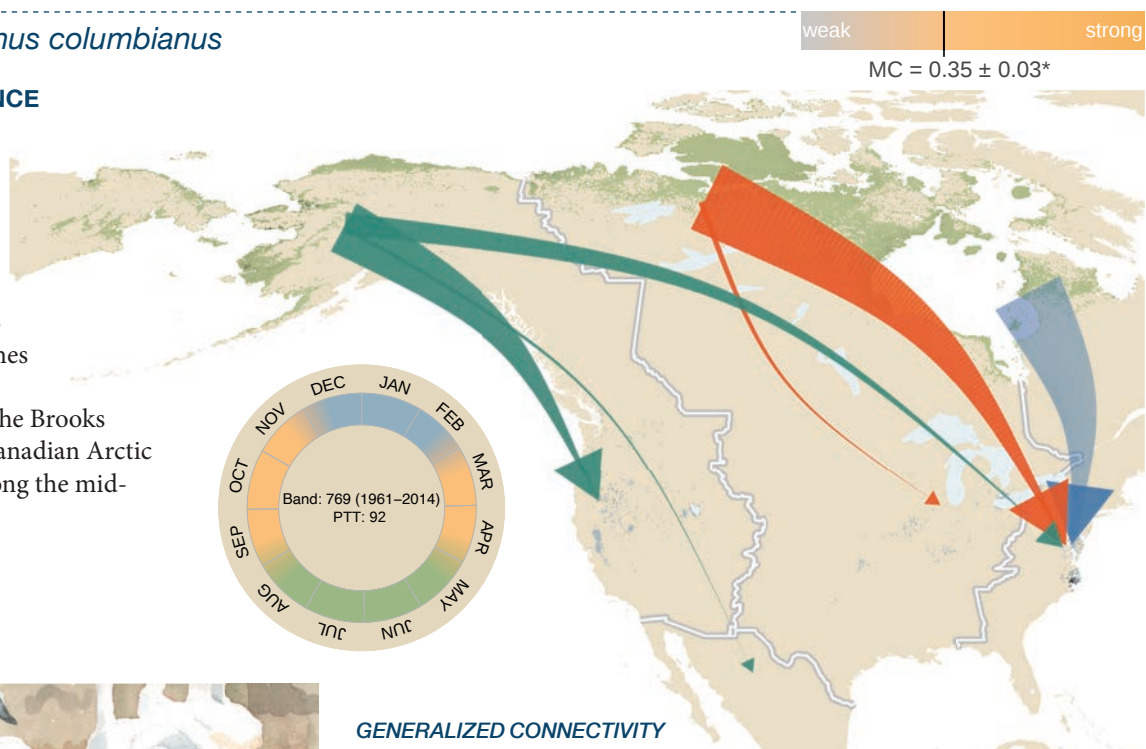
INTERESTING NOTE

Reintroduced Trumpeter Swans initially are often nonmigratory. As the population becomes more established, they migrate longer distances, suggesting migration is a learned behavior in Trumpeter Swans (Mitchell and Eichholz 2020).

TUNDRA SWAN *Cygnus columbianus*

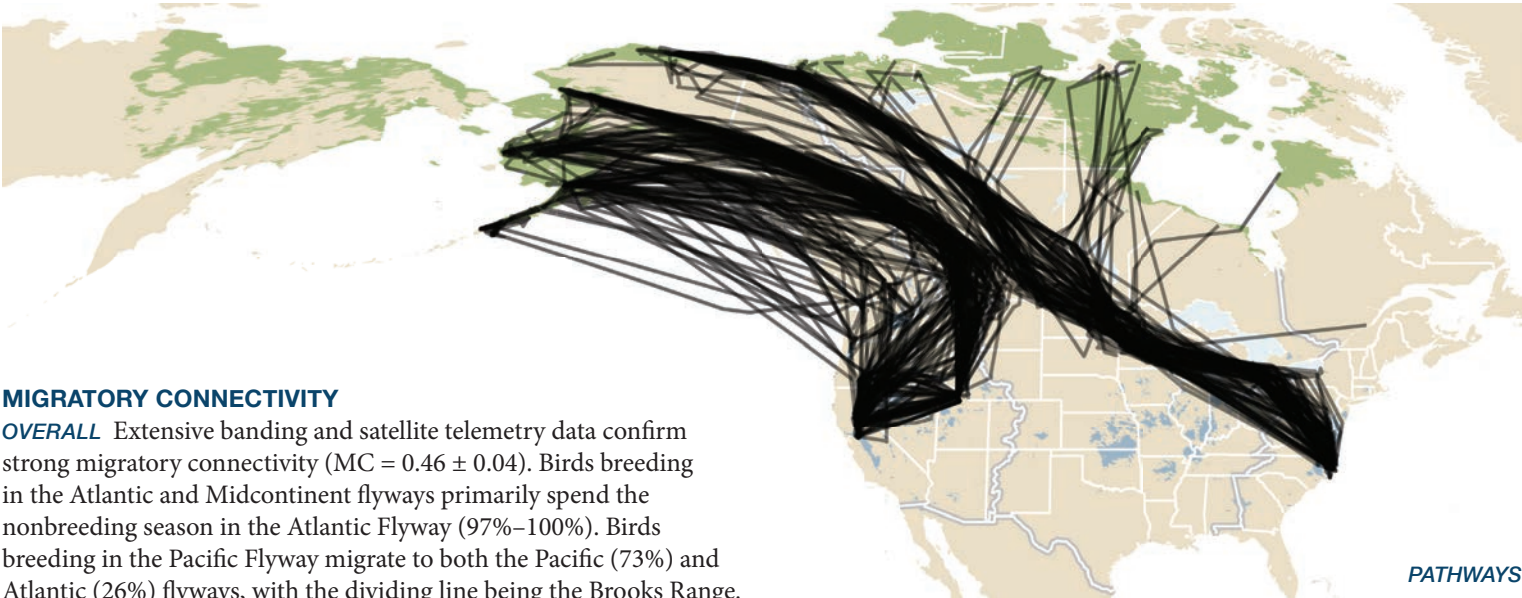
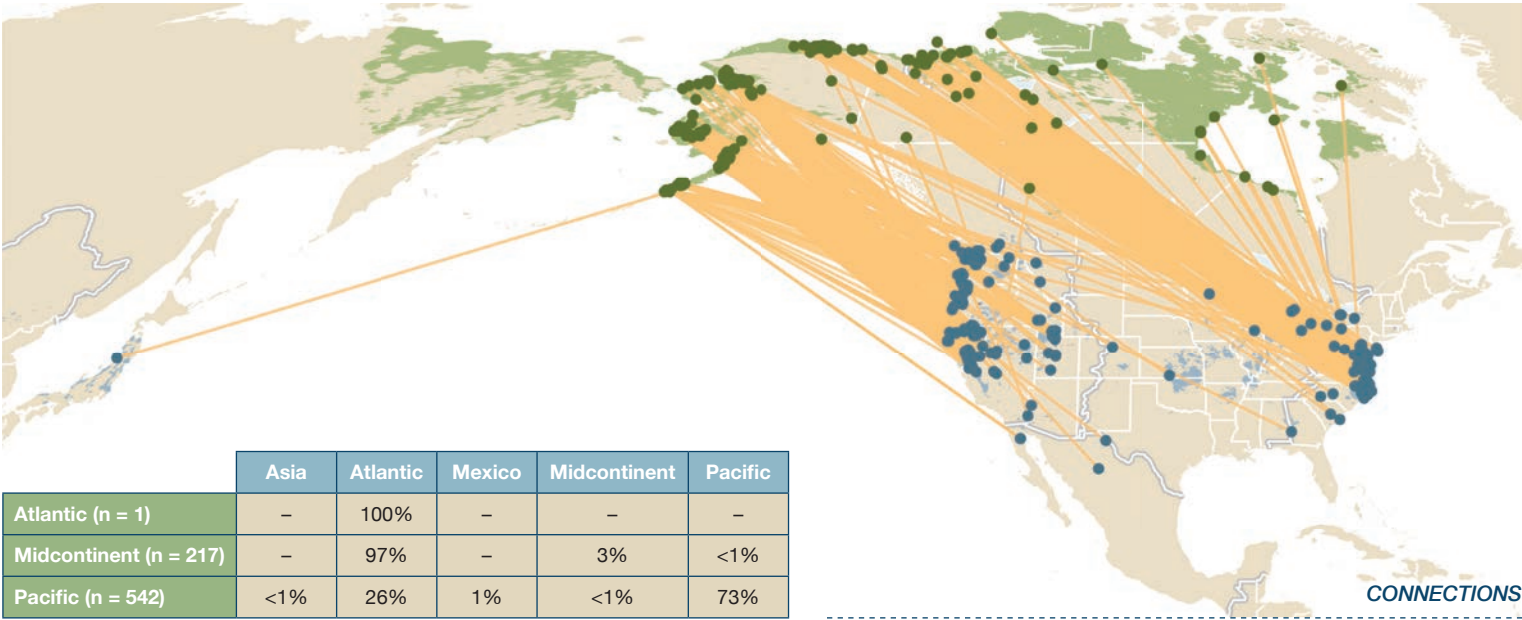
DISTRIBUTION AND ABUNDANCE

Tundra Swans breed in the Arctic, with concentrations in coastal Alaska and the central Arctic. Western breeders occur exclusively in Alaska and migrate to nonbreeding areas primarily in the Sacramento Valley of California and the marshes around the Great Salt Lake, Utah. Birds breeding north and east of the Brooks Range in Alaska and across the Canadian Arctic spend the nonbreeding season along the mid-Atlantic coast of the US.



GENERALIZED CONNECTIVITY

ORDER Anseriformes
 FAMILY Anatidae
 BREEDING HABITAT Wetlands, Tundra
 NONBREEDING HABITAT Wetlands, Generalist
 GLOBAL POPULATION SIZE 280,000
 POPULATION CHANGE SINCE 1970 +6%
 IUCN RED LIST CATEGORY Least Concern
 R2R TIPPING POINT SPECIES No
 US LISTING STATUS No
 CANADA SPECIES AT RISK No
 PIF CCS 11/20



MIGRATORY CONNECTIVITY

OVERALL Extensive banding and satellite telemetry data confirm strong migratory connectivity ($MC = 0.46 \pm 0.04$). Birds breeding in the Atlantic and Midcontinent flyways primarily spend the nonbreeding season in the Atlantic Flyway (97%–100%). Birds breeding in the Pacific Flyway migrate to both the Pacific (73%) and Atlantic (26%) flyways, with the dividing line being the Brooks Range.

BANDING Thousands of individuals have been fitted with bands and/or neck collars, showing evidence for longitudinal migration with a major divide in the Brooks Range in northern Alaska. Migratory connectivity is strong, although it is not unusual for eastern breeding birds to migrate to western states and vice versa (Ely et al. 1997, 2014; Dau and Sarvis 2002). Tundra Swans (n = 190) trapped on nonbreeding grounds in Oregon were banded and dyed yellow for visual resighting. Resightings demonstrated migration to breeding grounds in western Alaska (Paullin and Kridler 1988). Another 119 birds were fitted with neck collars on breeding areas in northwestern Alaska and tracked to nonbreeding areas almost entirely in Northern California (Moermond and Spindler 1997). Tundra Swans marked during breeding on the lower Alaska Peninsula sometimes remained local throughout the nonbreeding season (Dau and Sarvis 2002).

SATELLITE TRACKING Tundra Swans (n = 63) that were satellite tracked from their breeding grounds northeast of the Brooks Range in Alaska southeast to Ontario all migrated to the mid-Atlantic during the nonbreeding season (Weaver 2013). Tundra Swans breeding in western Alaska (n = 50) were tracked to nonbreeding sites in the Central Valley of California and eastern Oregon (Ely and Meixell 2016). Individuals from the western population migrated

inland and spent months on staging areas in interior Yukon, Montana, and Idaho, before finishing migration to nonbreeding areas in Northern California (Ely et al. 1997). One study satellite tracked 43 birds from their nonbreeding grounds in the mid-Atlantic, where they migrated northwest to breeding grounds from northeastern Alaska to eastern Canada. Satellite-tagged birds (n = 12) captured mid-migration in Ontario showed similar patterns, migrating between the mid-Atlantic in the nonbreeding season and the central part of their breeding range (Petrie and Wilcox 2003).

OTHER APPROACHES No genetic or stable isotope studies of migratory connectivity were found for this species.

MIGRATORY PATHWAYS Western birds migrated south along the Rockies and the Cascades to nonbreeding areas in valleys in the western United States, while eastern birds congregated on the northern Great Plains from spatially disperse breeding grounds, then migrated past the southern Great Lakes to major nonbreeding areas in the mid-Atlantic. Eastern Tundra Swans follow similar post-breeding and pre-breeding migration routes in an L shape, whereby birds migrate west to the Great Lakes, then north toward various breeding locations (Wilkins et al. 2010).

DATA CONTRIBUTORS

D.C. Douglas; C. Ely; J. Terenzi; T.L. Tibbitts.

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

WOOD DUCK

Aix sponsa

weak

strong

MC = 0.51 ± 0.01*

DISTRIBUTION AND ABUNDANCE

Wood Ducks are endemic to North America and occur east of the Rocky Mountains with a disjunct population in the west from Washington south to California. The eastern population is large and disperse, while the western population is small but locally abundant. Western birds migrate from breeding areas in Oregon, Washington, Nevada, and California to ice-free wetlands generally in California (Baldassarre 2014). They have migratory and nonmigratory populations (Bellrose and Holm 1994; Hepp and Bellrose 2020).

Band: 17,276
(1927–2014)
GPS: 4

DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV



ORDER Anseriformes

FAMILY Anatidae

BREEDING HABITAT Wetlands, Forested

NONBREEDING HABITAT Wetlands, Forested

GLOBAL POPULATION SIZE 4,600,000

POPULATION CHANGE SINCE 1970 +133%

IUCN RED LIST CATEGORY Least Concern

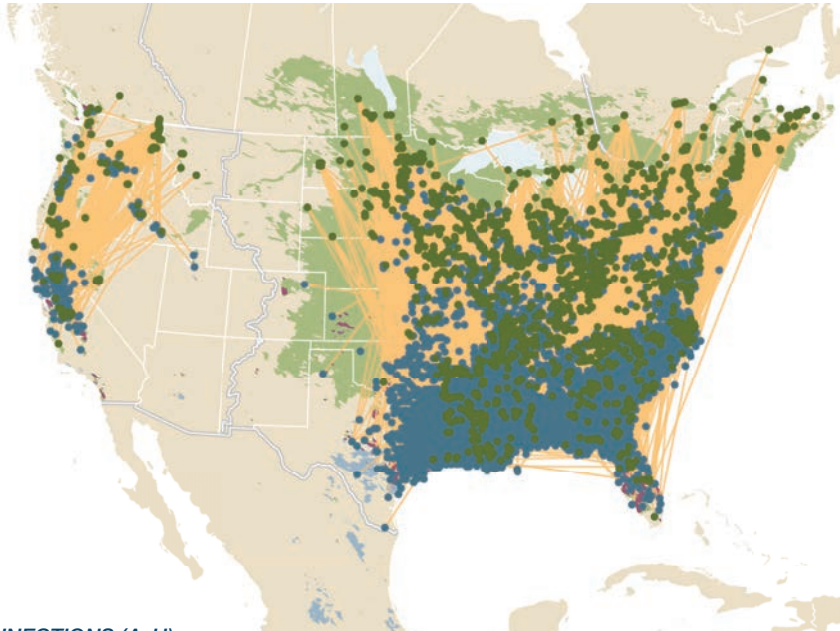
R2R TIPPING POINT SPECIES No

US LISTING STATUS No

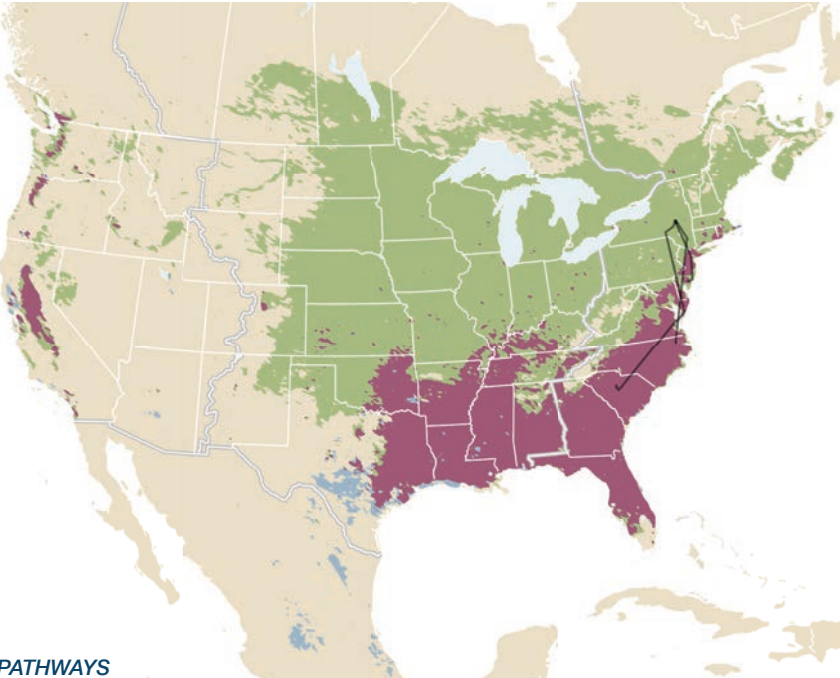
CANADA SPECIES AT RISK No

PIF CCS 7/20

GENERALIZED CONNECTIVITY



CONNECTIONS (A–H)



MIGRATORY CONNECTIVITY

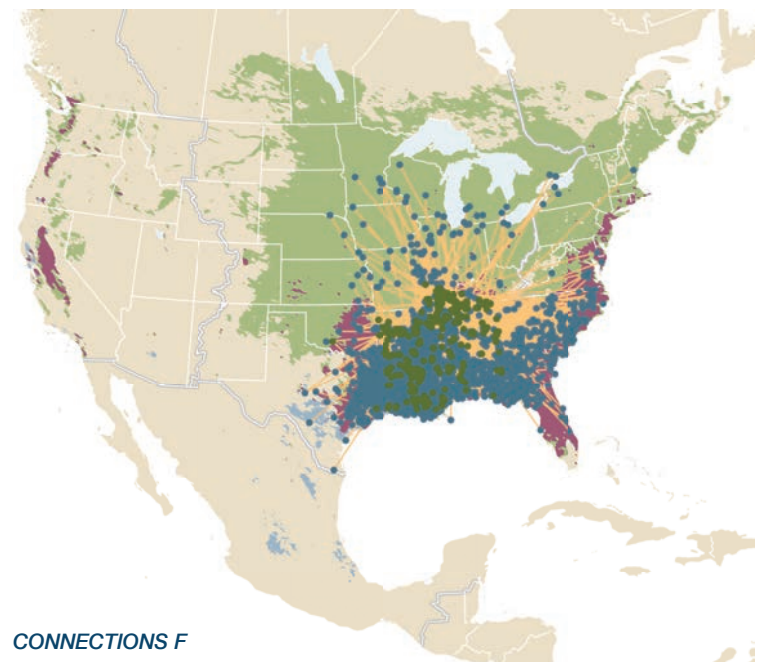
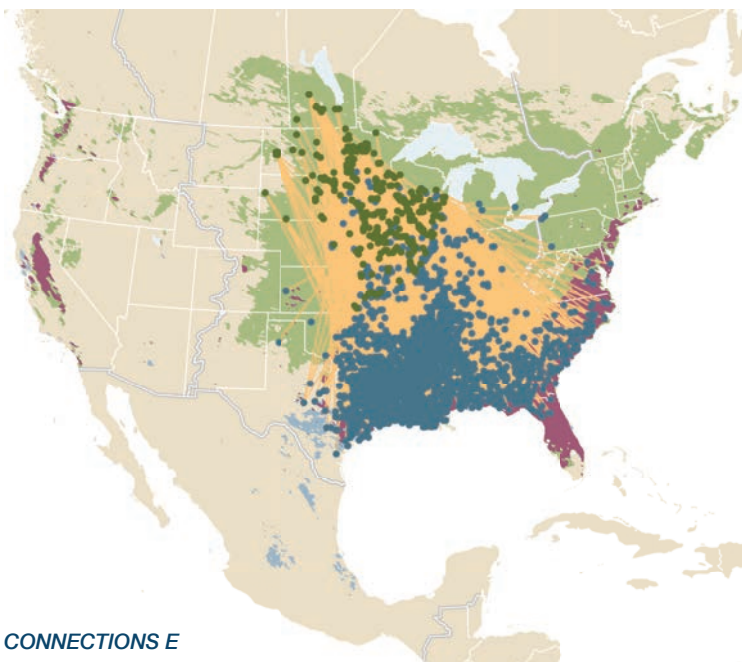
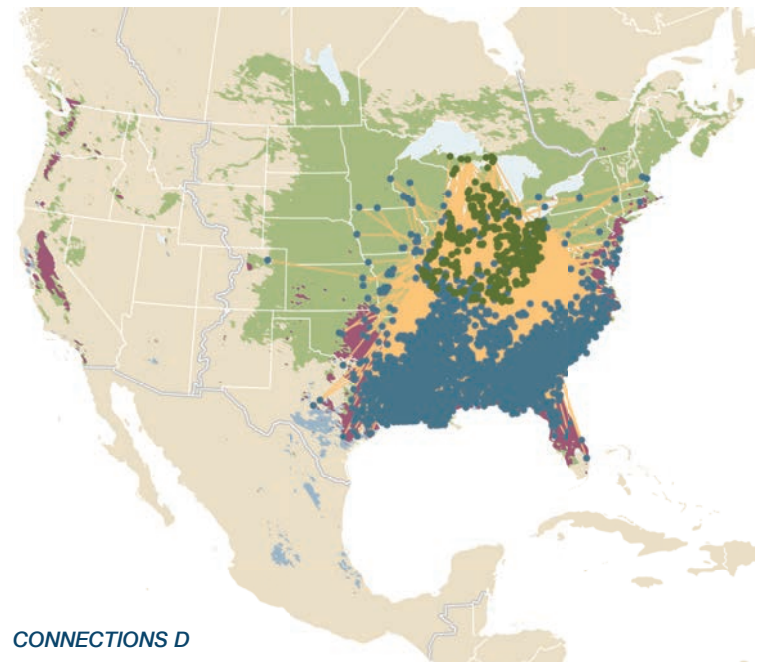
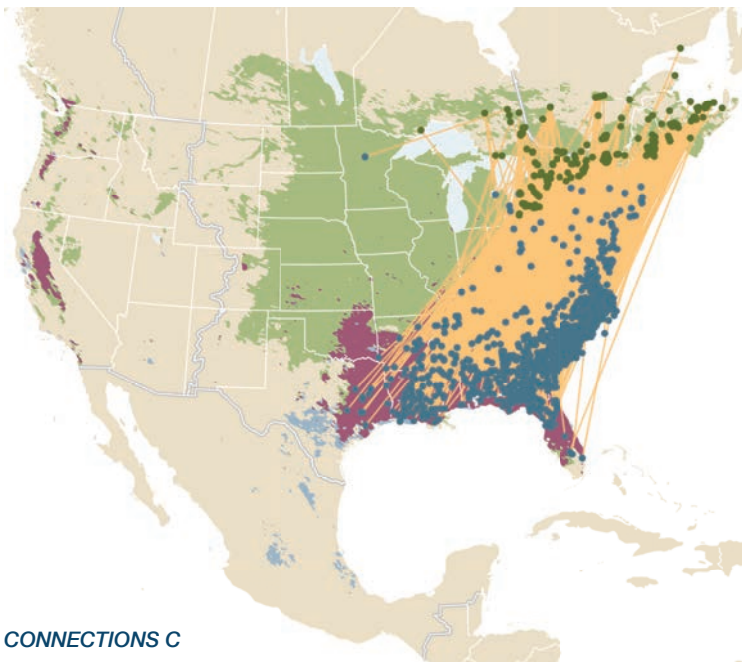
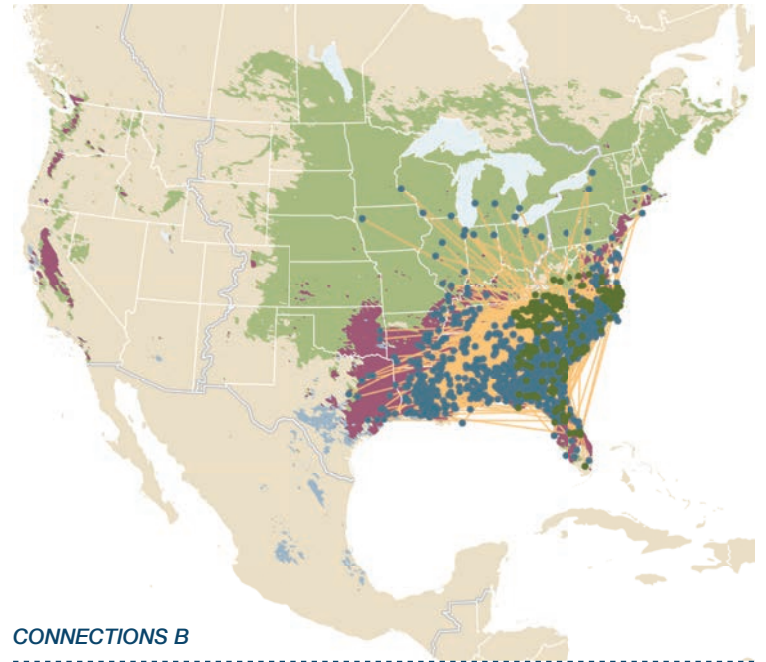
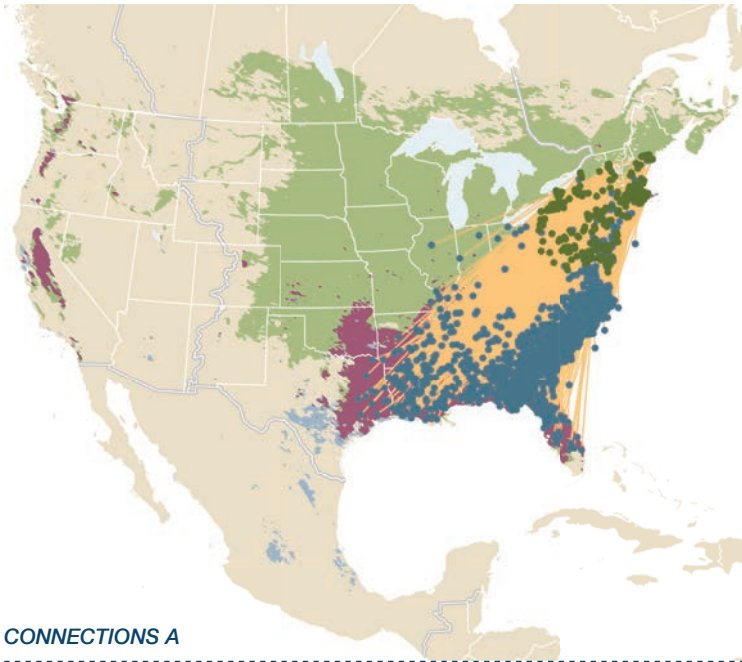
OVERALL

Wood Ducks are one of the most studied waterfowl species, and although some information about migratory connectivity is available from banding and genetics data, overall, we know very little. There is a separation of eastern and western populations, as well as high transition rates within breeding to nonbreeding flyways, resulting in strong migratory connectivity (MC = 0.51 ± 0.01). There is some overlap in the eastern populations, with Atlantic Flyway breeding birds migrating to the Midcontinent Flyway (20%) and Midcontinent Flyway birds migrating to the Atlantic Flyway (17%).

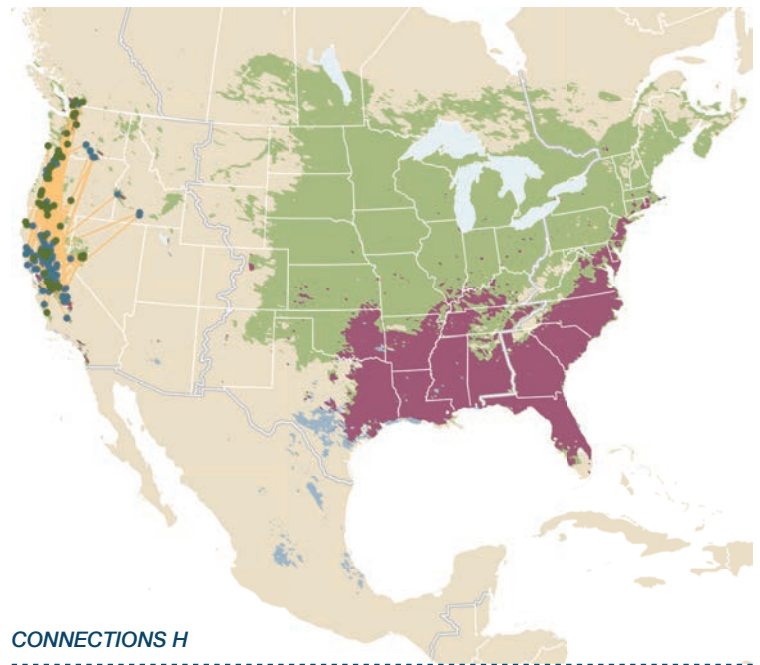
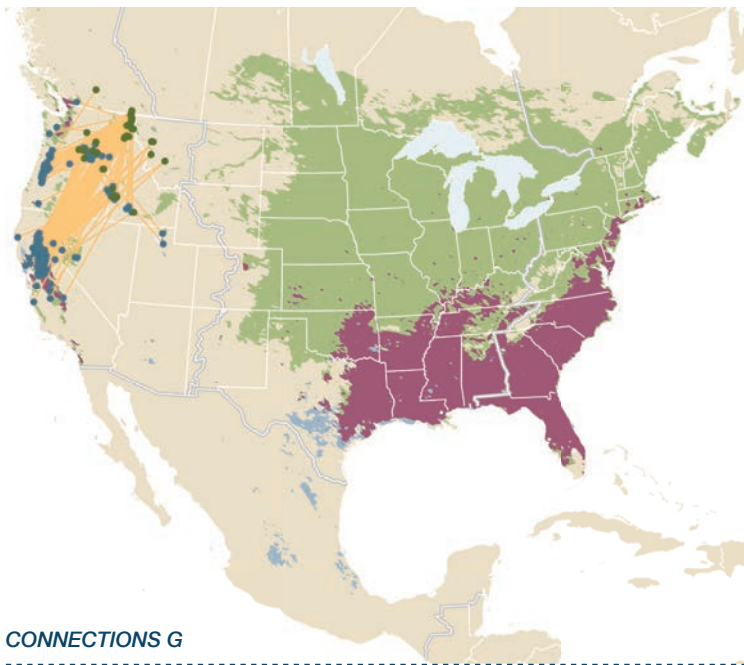
	Atlantic	Midcontinent	Pacific
Atlantic (n = 4060)	80%	20%	–
Midcontinent (n = 12551)	17%	83%	–
Pacific (n = 1)	–	–	100%

56

For general queries, contact info@press.princeton.edu



DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)



BANDING Banding data suggest about a third of eastern Wood Ducks are nonmigratory (Bellrose and Holm 1994).

RADIO TRACKING A few tags were deployed through the Motus Wildlife Tracking System; there were no breeding to nonbreeding detections.

SATELLITE TRACKING Limited data exists from satellite tracking. Wood Ducks tracked from New York migrated to nonbreeding areas in New Jersey, North Carolina, and South Carolina (M. Losito et al., unpublished data).

STABLE ISOTOPES No stable isotope studies of migratory connectivity were found for this species.

GENETICS Genetic evidence from mtDNA shows strong differentiation between eastern and western populations (Peters et al. 2005). The eastern population has high genetic diversity and has experienced population expansion, while the western population is more genetically homogeneous and has not seen the same growth.

DATA CONTRIBUTORS

M. Losito; R. Masse; C. Slezak; E. Struening.

Differentiation likely occurred during the last North American glaciation (Peters et al. 2005).

OTHER APPROACHES Differences existed between parasitic helminth diversity of Wood Ducks collected from the northeastern portion of their breeding range versus the southeastern portion, suggesting some population differentiation (Thul et al. 1985).

MIGRATORY PATHWAYS Wood Ducks breeding in northeastern states and eastern Canadian provinces generally migrate directly south to nonbreeding areas, based on a pattern of band recoveries.

INTERESTING NOTE

The recovery of Wood Ducks from near extinction to current abundance is one of the more remarkable wildlife recovery success stories, and their populations have continued to increase. The process of captive-rearing and releasing Wood Ducks was key to the revival of the population, and released birds in the northern portion of their range readily learned to migrate and return to release locations (Lee and Nelson 1965).

BLUE-WINGED TEAL *Spatula discors*

DISTRIBUTION AND ABUNDANCE

The Blue-winged Teal is a common breeder in the Prairie Pothole Region of North America and is present in low abundance in boreal forest breeding areas. Nonbreeding season concentrations occur along the Gulf Coast and in Mexico and Central America (Rohwer et al. 2020).

ORDER Anseriformes

FAMILY Anatidae

BREEDING HABITAT Wetlands, Seasonally Wet Grasslands

NONBREEDING HABITAT Coasts, Salt Marsh

GLOBAL POPULATION

SIZE 7,800,000

POPULATION CHANGE

SINCE 1970 +98%

IUCN RED LIST CATEGORY

Least Concern

R2R TIPPING POINT SPECIES No

US LISTING STATUS No

CANADA SPECIES AT RISK No

PIF CCS 8/20

weak strong
MC = 0.08 ± 0.02*



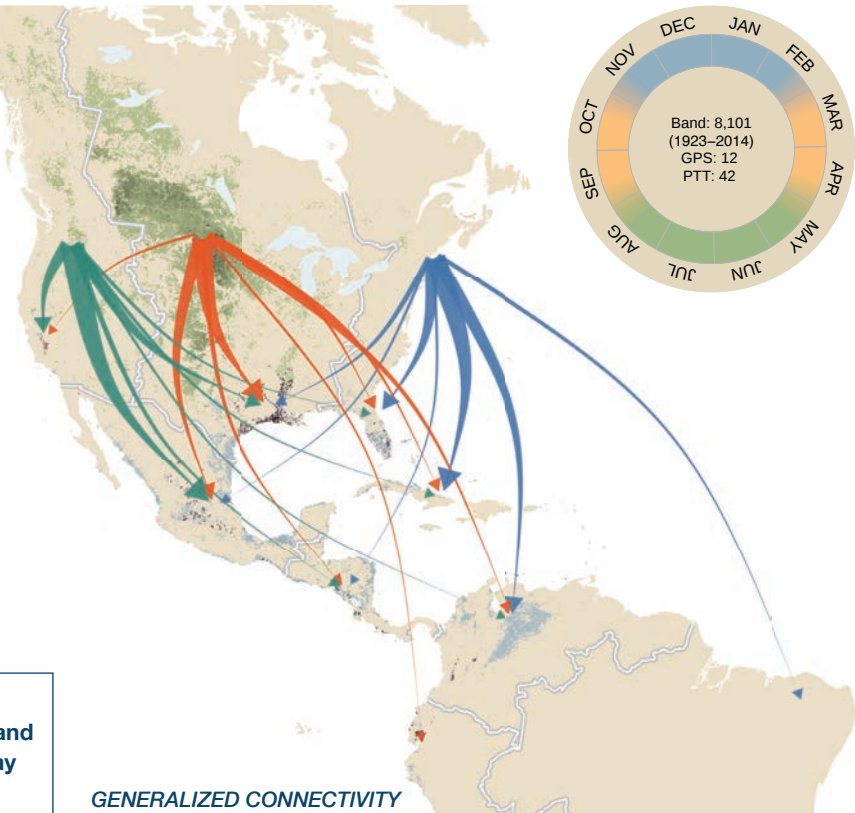
MIGRATORY CONNECTIVITY

OVERALL Migratory connectivity data are available from satellite transmitters, band recoveries, and stable isotopes. Blue-winged Teal have been considered a major carrier of avian influenza, resulting in significant research on their migration routes and distribution. Birds transition from their breeding grounds across their nonbreeding range. Atlantic Flyway breeding birds migrate to nonbreeding areas across the range including the Caribbean (40%), Atlantic Flyway (24%), and Northern South America (24%). Breeding birds from the Midcontinent Flyway also migrate to many nonbreeding regions, with the highest percentage in the Midcontinent Flyway (38%). Pacific Flyway breeding birds primarily migrate to Mexico (44%), the Midcontinent Flyway (20%), or nonbreeding areas within the Pacific Flyway (22%). This diffuse migration results in weak migratory connectivity ($MC = 0.08 \pm 0.02$).

BANDING Large numbers of individuals banded in Alberta and Saskatchewan have been recovered across their nonbreeding range in Mexico, Cuba, Colombia, Venezuela, and Nicaragua (Ramey et al. 2016).

SATELLITE TRACKING Blue-winged Teal tracked by satellite transmitters ($n = 42$) from their breeding grounds in Canada migrated to the southeastern United States,

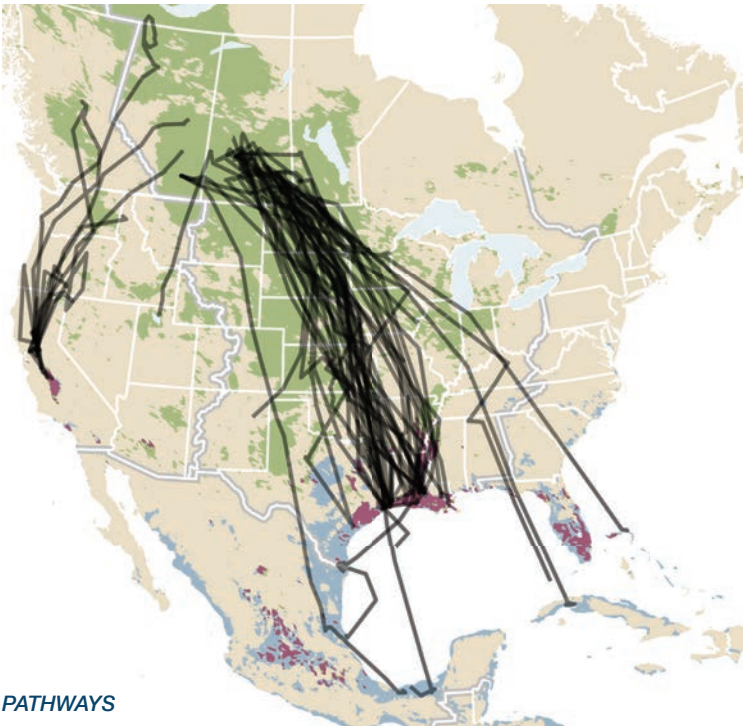
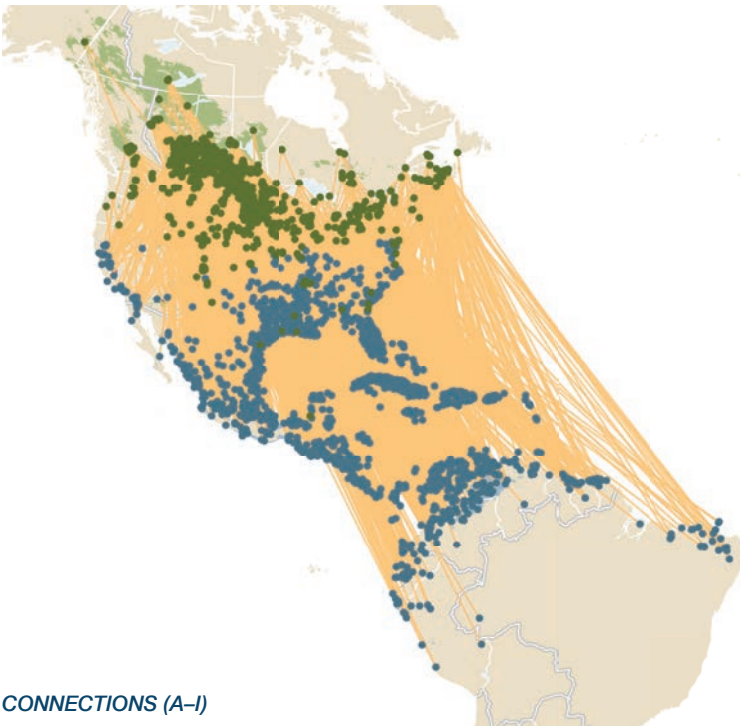
Mexico, and the Caribbean (Ramey et al. 2019). A sample of 12 individuals migrated to both the Neotropics and the coast of Texas and Louisiana (Ramey et al. 2016). Birds tracked from nonbreeding areas in California's Central Valley migrated to breeding areas in western Canada and the western United States (US Geological Survey, unpublished data).



INTERESTING NOTE

A small but regular number of Blue-winged Teal from North and South America are found across the Atlantic in Europe and Africa. These were previously thought to be vagrants but may actually be regular migrants (De Juana and Garcia 2010).

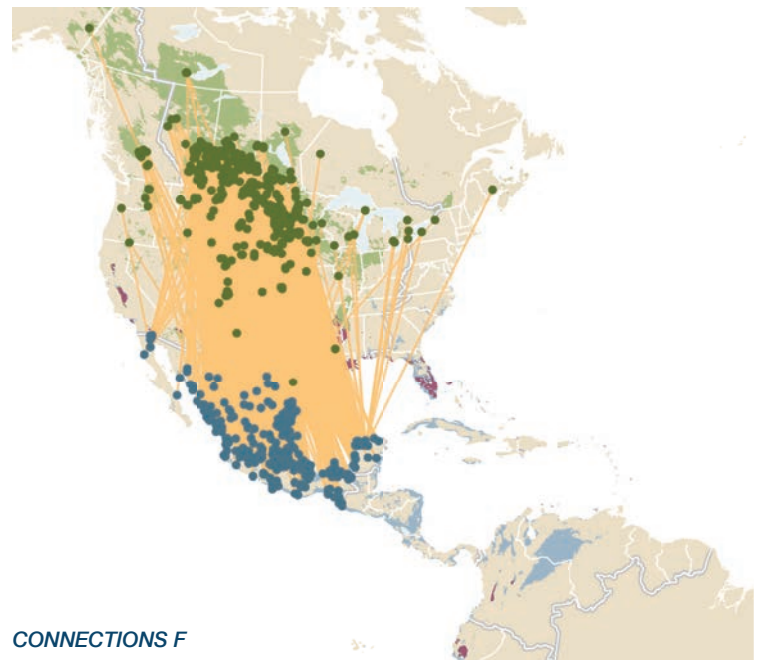
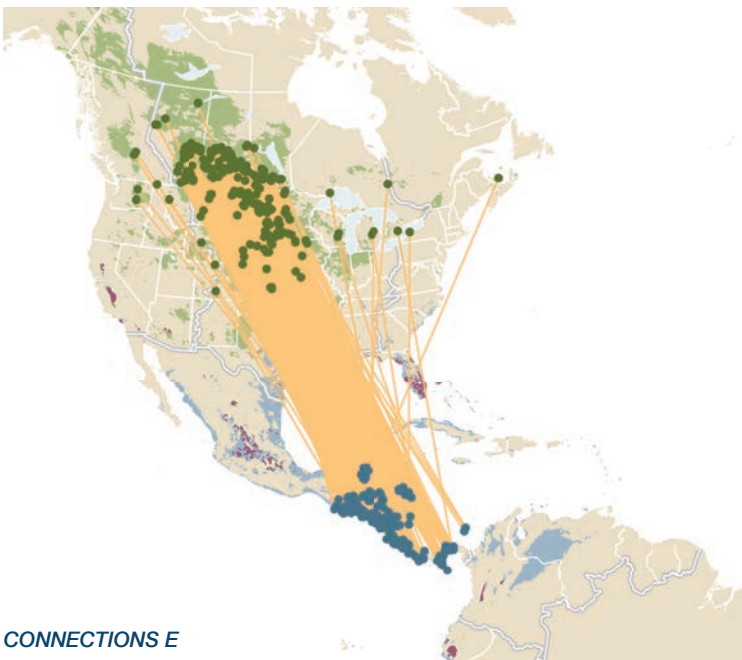
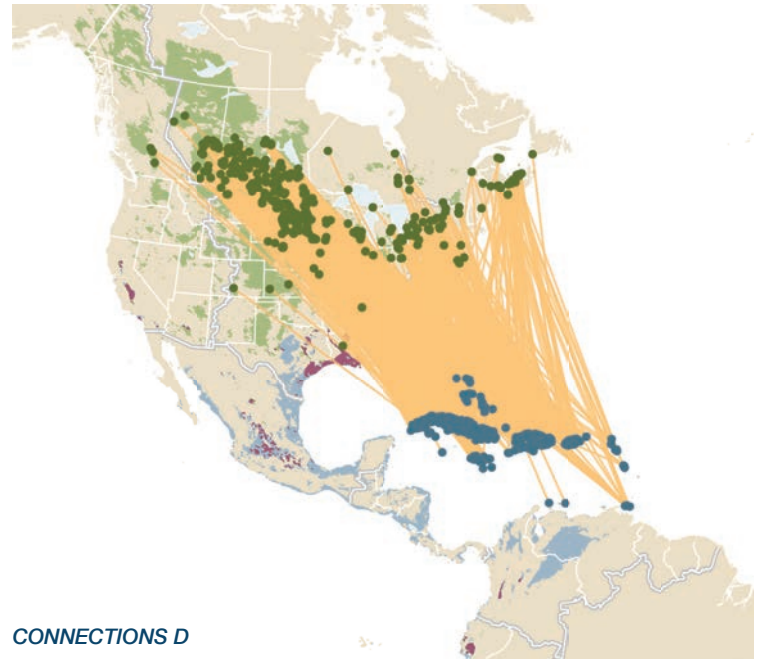
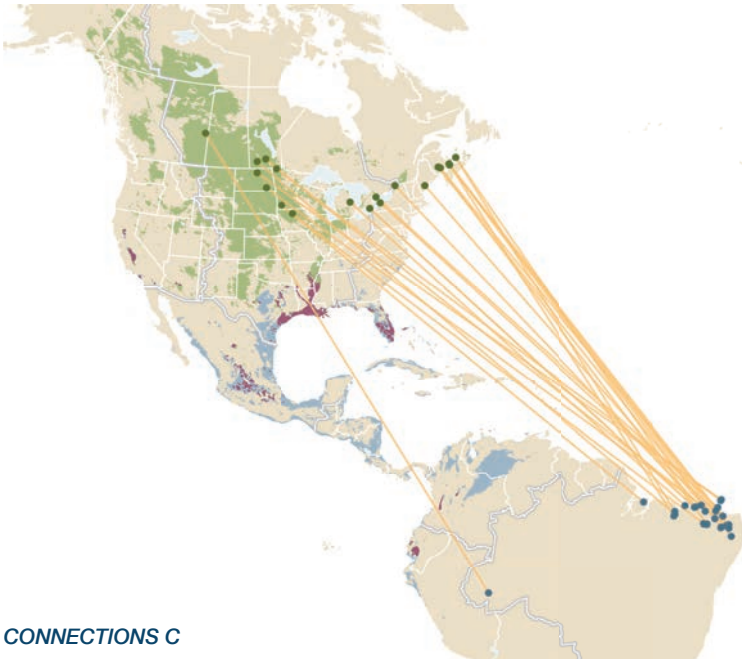
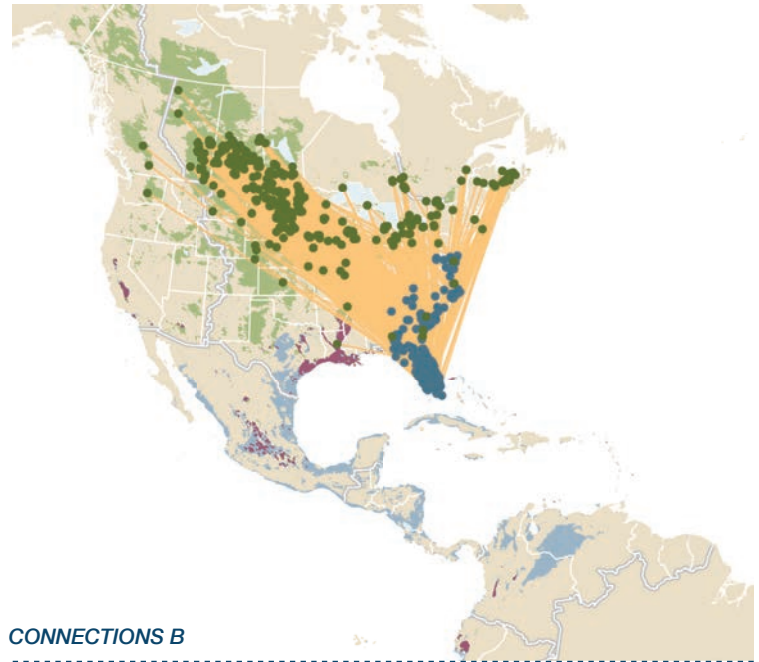
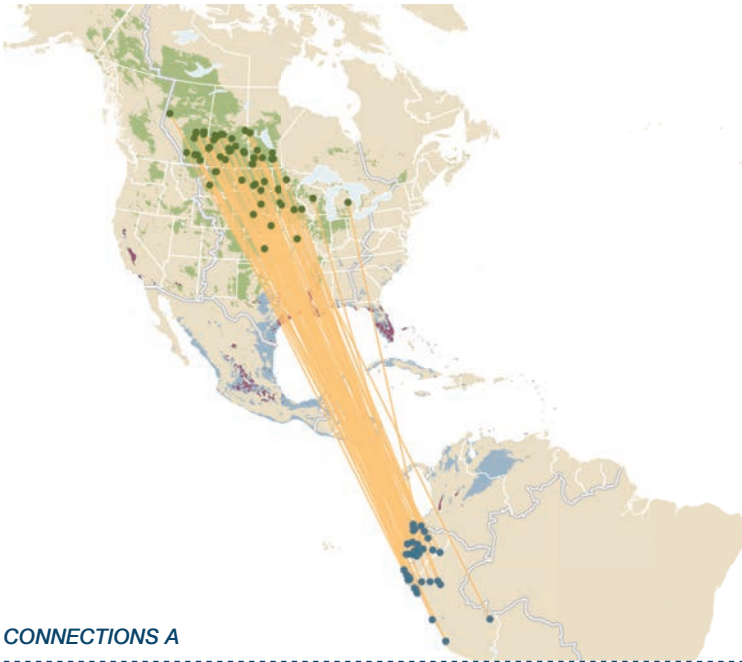
	Andean West	Atlantic	Brazil	Caribbean	Central America	Mexico	Midcontinent	Northern SA	Pacific
Atlantic (n = 302)	–	24%	4%	40%	1%	1%	7%	24%	–
Midcontinent (n = 7681)	1%	11%	<1%	10%	7%	22%	38%	11%	1%
Pacific (n = 91)	–	3%	–	3%	7%	44%	20%	1%	22%

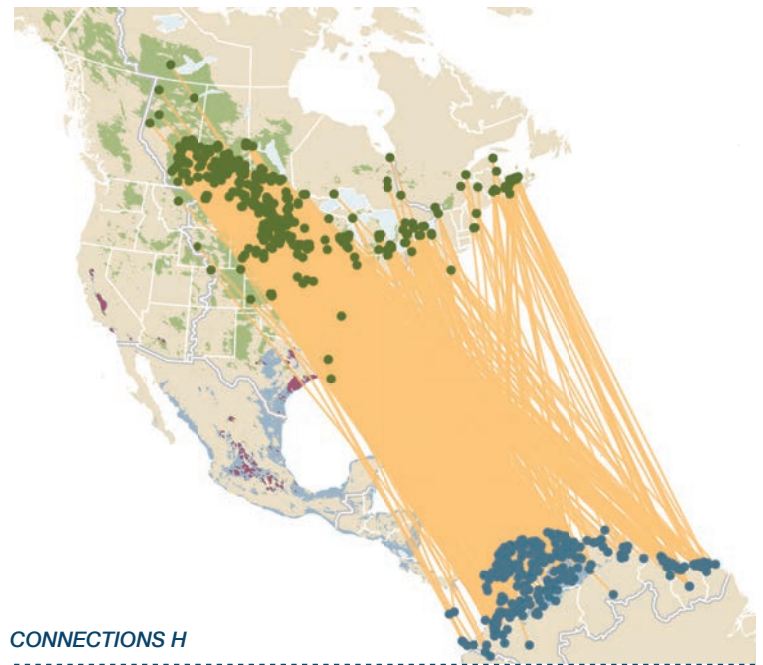
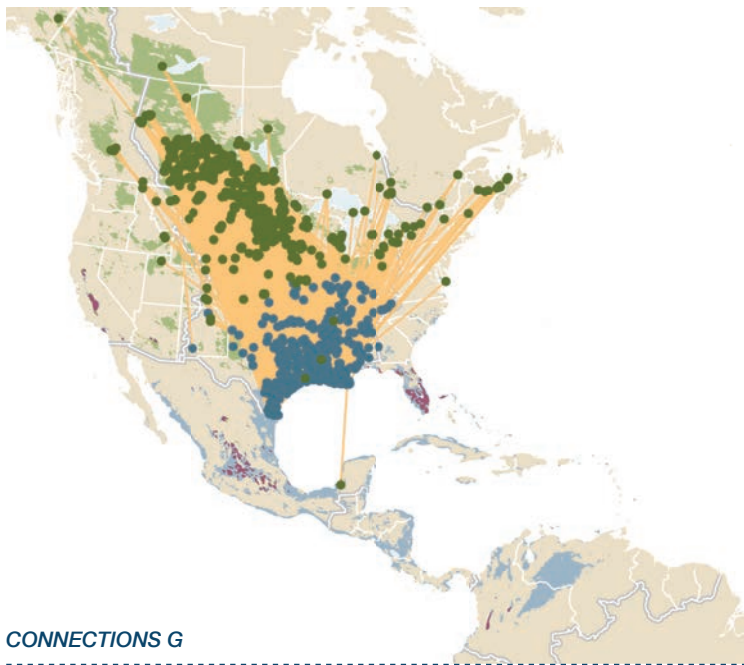


CONNECTIONS (A–I)

PATHWAYS

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)



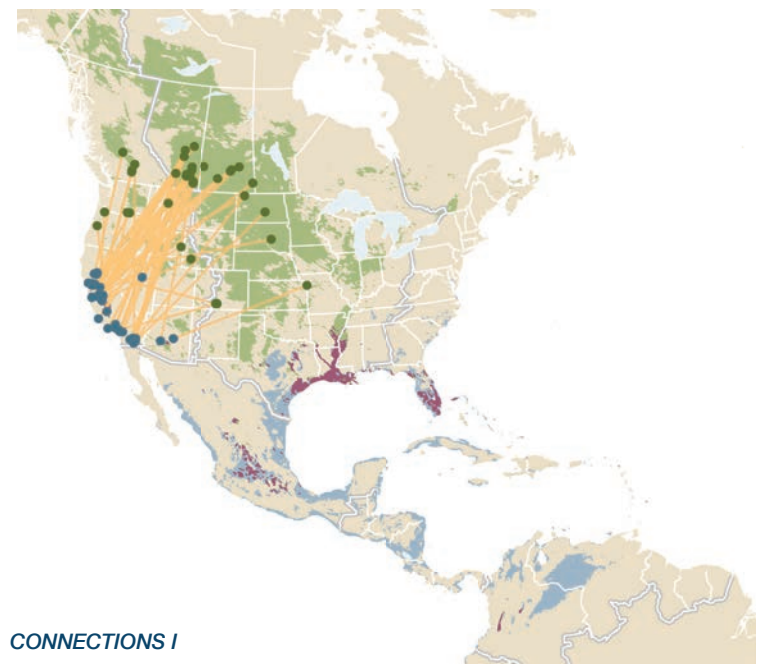


GENETICS No genetic studies of migratory connectivity were found for this species.

STABLE ISOTOPES Birds collected in the Saskatchewan River Delta, Canada, ($n = 52$) were assigned to breeding grounds north of Saskatchewan and to the south in the Prairie Pothole Region using stable isotope analysis (Asante et al. 2017). Stable isotope analysis suggests Blue-winged Teal harvested in Ontario come from north and west of the recovery range, in contrast to banding data showing breeding birds originating farther east. This discrepancy is likely a result of available banding sites (Palumbo et al. 2020).

OTHER APPROACHES Blue-winged Teal collected in the northern breeding areas and along the Gulf Coast had parasites known from South America (Ramey et al. 2016). These birds had numerous parasites that were genetically similar to parasites from both North and South America, indicating a clear link between continents. Helminth communities of host Blue-winged Teal differed among birds using a north-south migratory pathway versus those using an eastern pathway through Florida (Garvon et al. 2011).

MIGRATORY PATHWAYS Blue-winged Teal utilize two primary pathways during migration. The first starts in the northern Great Plains and continues south through Texas and Louisiana. The second is a more easterly route, starting in Manitoba and the Great Lakes states and then heading southeast through Florida and over the Atlantic Ocean to the Caribbean and South America (Sharp 1972; Baldassarre 2014). The Saskatchewan River Delta appears to be an



CONNECTIONS I

important stopover site for individuals using the Central Flyway (Asante et al. 2017). Recent tracking of western populations will help discover migratory pathways in the western US (US Geological Survey, unpublished data).

DATA CONTRIBUTORS

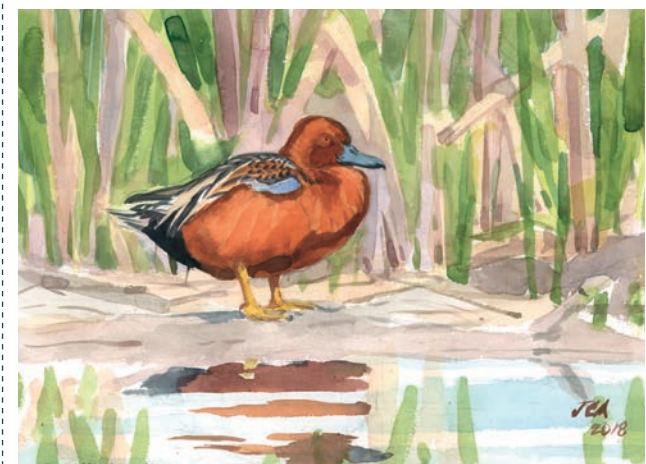
M. Casazza; D.C. Douglas; C. Feldheim; C. Overton; A. Ramey.

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

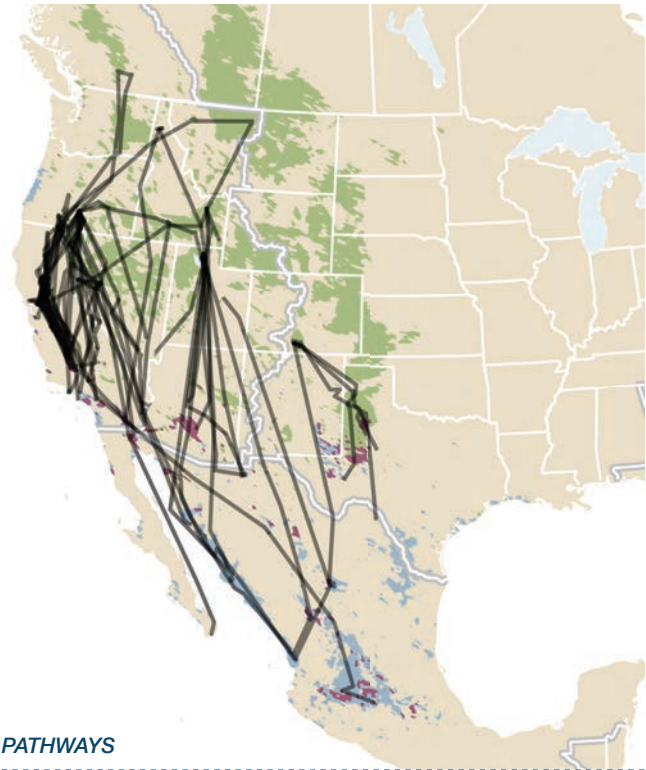
CINNAMON TEAL *Spatula cyanoptera*

weak | strong
MC = 0.19 ± 0.05*

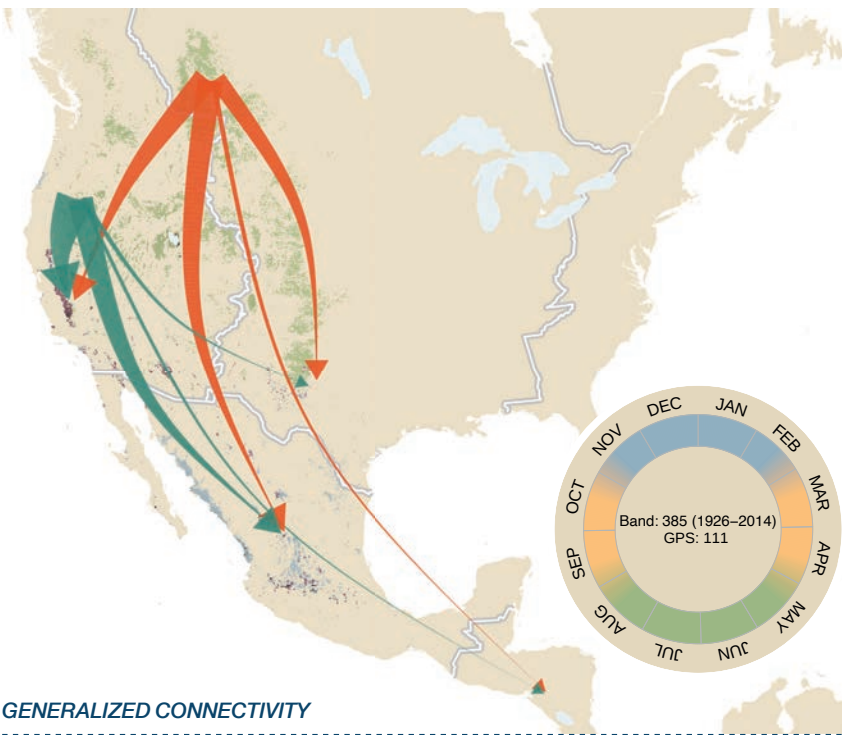
DISTRIBUTION AND ABUNDANCE
Cinnamon Teal consist of five subspecies, one of which inhabits North America (*S. c. septentrionalium*). This subspecies breeds in the western United States and Canada, particularly the Great Basin. The nonbreeding range encompasses the Central Valley of California, the Pacific coast of Mexico, and central Mexico, with large concentrations in Sonora, Sinaloa, and Nayarit, Mexico (Gammonley 2020).



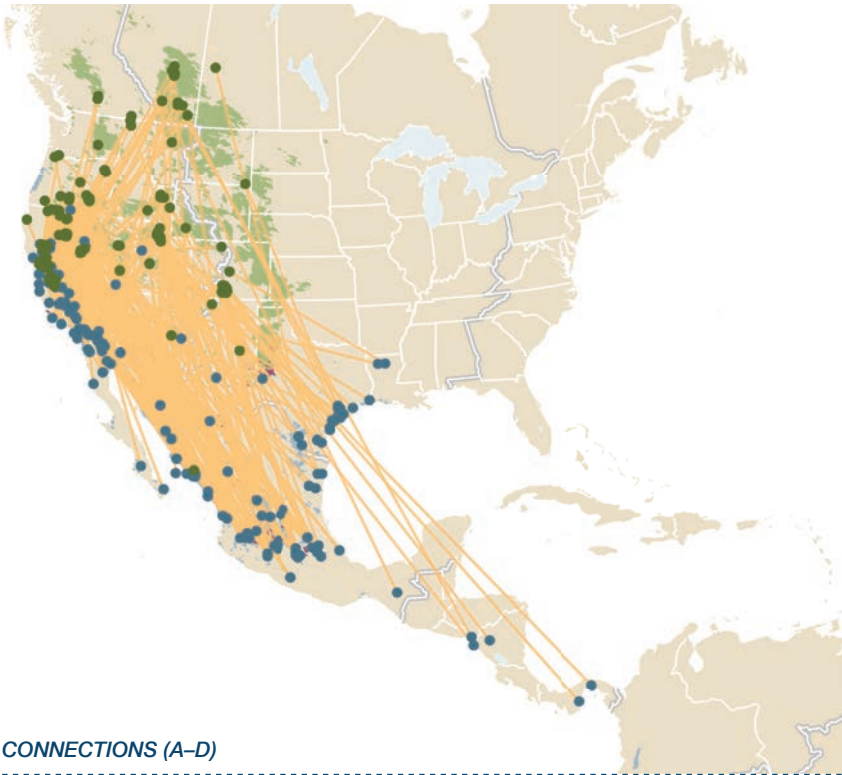
ORDER Anseriformes
FAMILY Anatidae
BREEDING HABITAT Wetlands, Freshwater Marsh
NONBREEDING HABITAT Wetlands, Freshwater Marsh
GLOBAL POPULATION SIZE 380,000
POPULATION CHANGE SINCE 1970 -63%
IUCN RED LIST CATEGORY Least Concern
R2R TIPPING POINT SPECIES No
US LISTING STATUS No
CANADA SPECIES AT RISK No
PIF CCS 12/20



PATHWAYS



GENERALIZED CONNECTIVITY

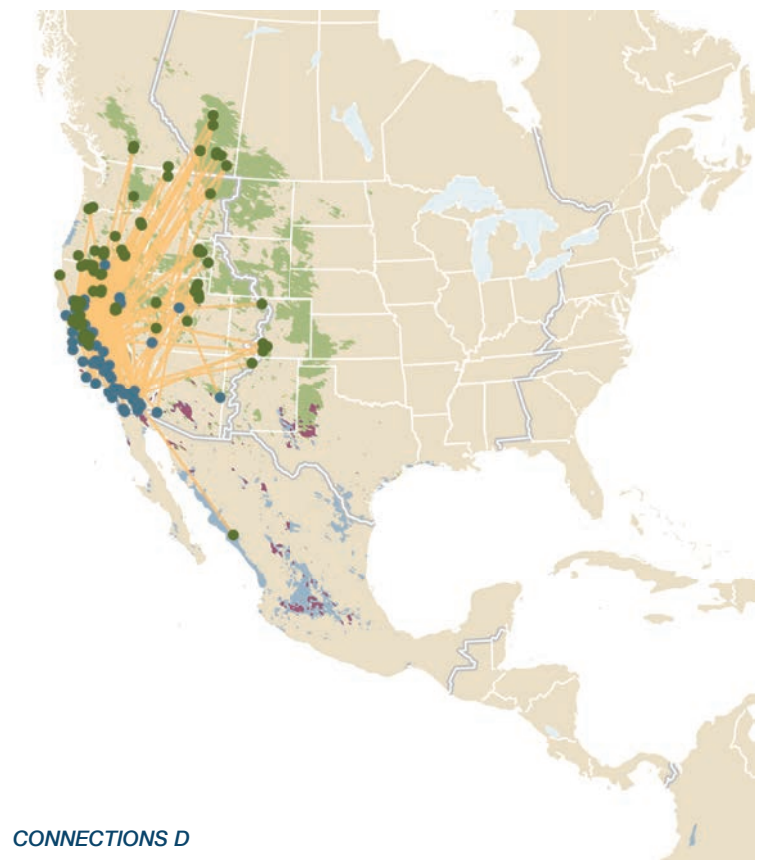
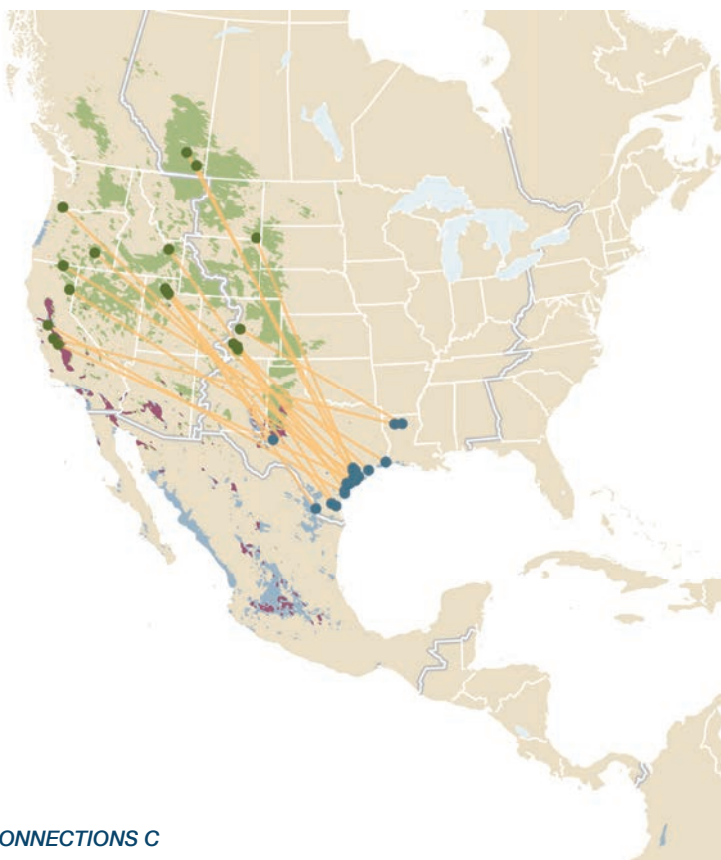
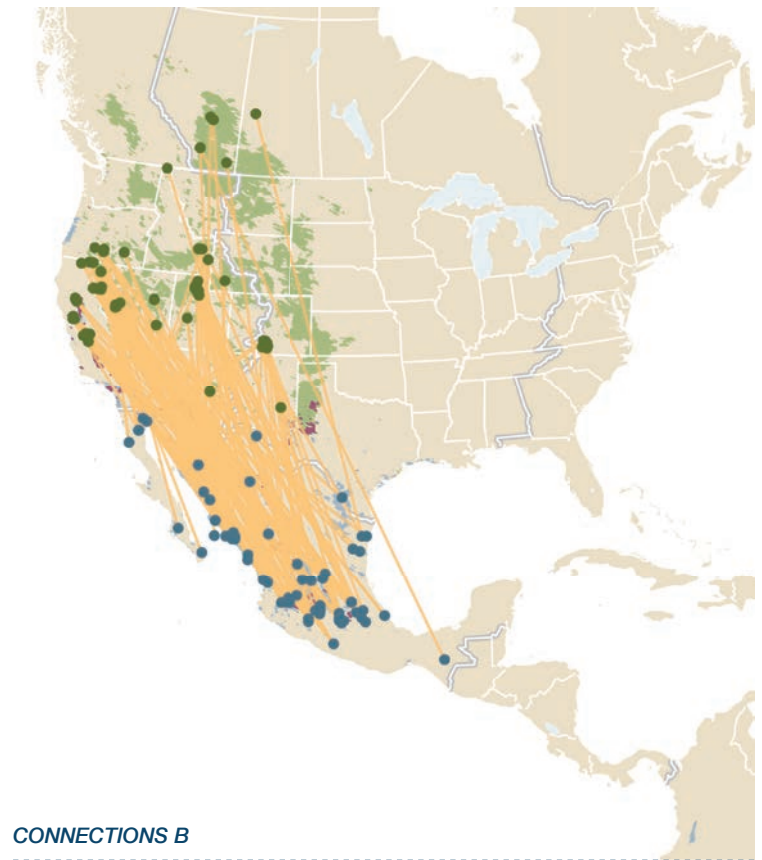
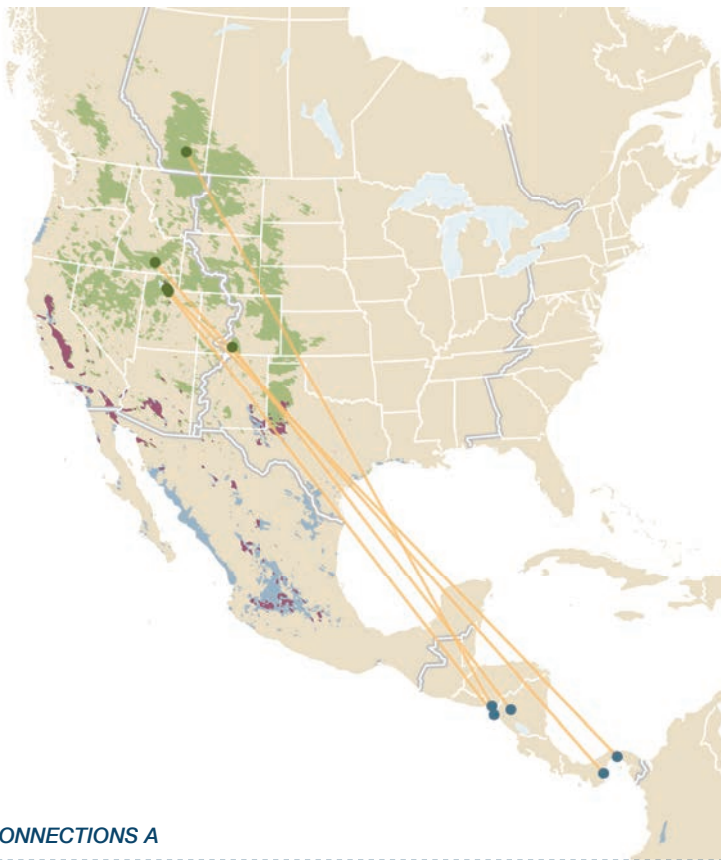


CONNECTIONS (A-D)

	Central America	Mexico	Midcontinent	Pacific
Midcontinent (n = 58)	3%	36%	24%	36%
Pacific (n = 436)	1%	36%	3%	60%

MIGRATORY CONNECTIVITY

OVERALL Birds breeding in the Midcontinent Flyway migrate to nonbreeding areas in the Pacific Flyway (36%), Mexico (36%), and the Midcontinent Flyway (24%). Pacific Flyway breeding birds were more likely to migrate to nonbreeding areas within the Pacific Flyway (60%) or Mexico (36%). Mixing of some breeding populations across the nonbreeding range results in moderate migratory connectivity (MC = 0.19 ± 0.05).



RADIO TRACKING A few tags were deployed through the Motus Wildlife Tracking System; there were no breeding to nonbreeding detections.

SATELLITE TRACKING Breeding Cinnamon Teal ($n = 223$) were tracked from breeding areas across the western United States (Mackell et al. 2021). Some birds were resident in California's Central

Valley ($n = 43$), while migratory movements of other individuals were primarily to nonbreeding areas in northern and central Mexico (US Geological Survey, unpublished data).

OTHER APPROACHES No stable isotope or genetic studies of migratory connectivity were found for this species.

DATA CONTRIBUTORS

M. Casazza; D. Mackell; D. Olson; C. Overton.

DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

NORTHERN SHOVELER

Spatula clypeata

weak

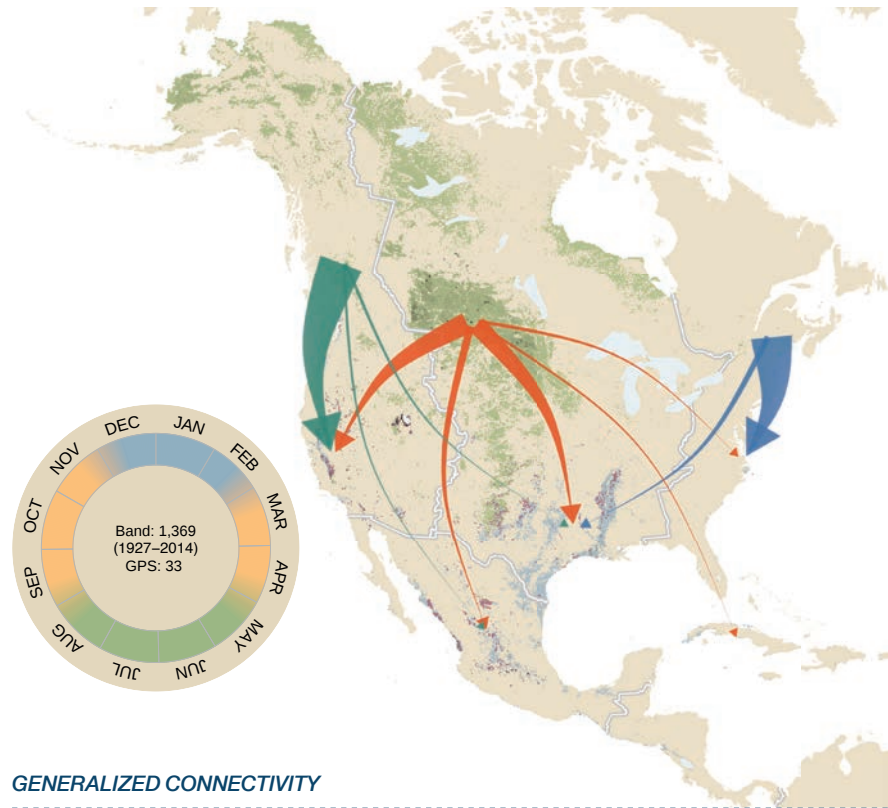
strong

MC = 0.18 ± 0.04*

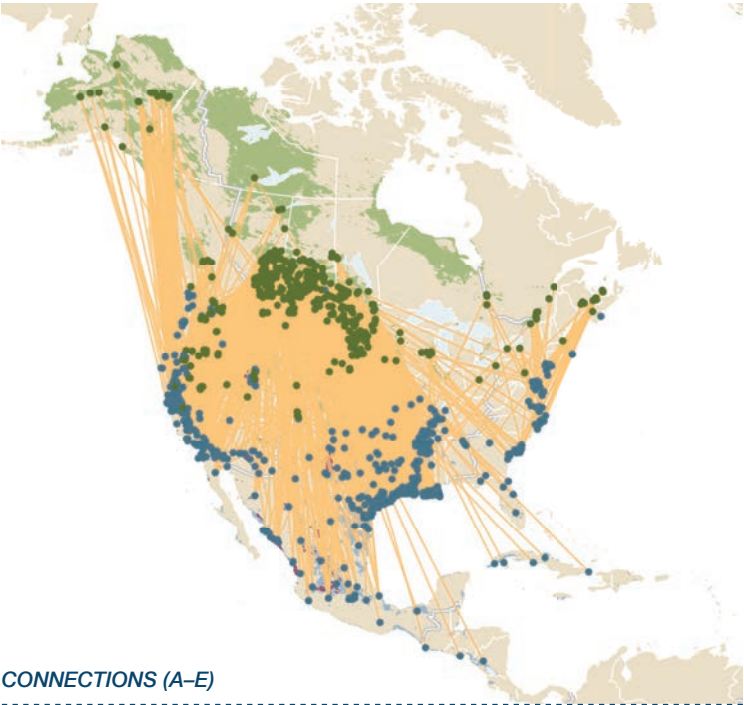
DISTRIBUTION AND ABUNDANCE
Northern Shovelers have a circumpolar distribution, but in North America they breed primarily in the Prairie Pothole Region. Nonbreeding concentrations occur in the Central Valley of California, the Great Salt Lake, the Gulf Coast, and interior Mexico (Dubowy et al. 2020).



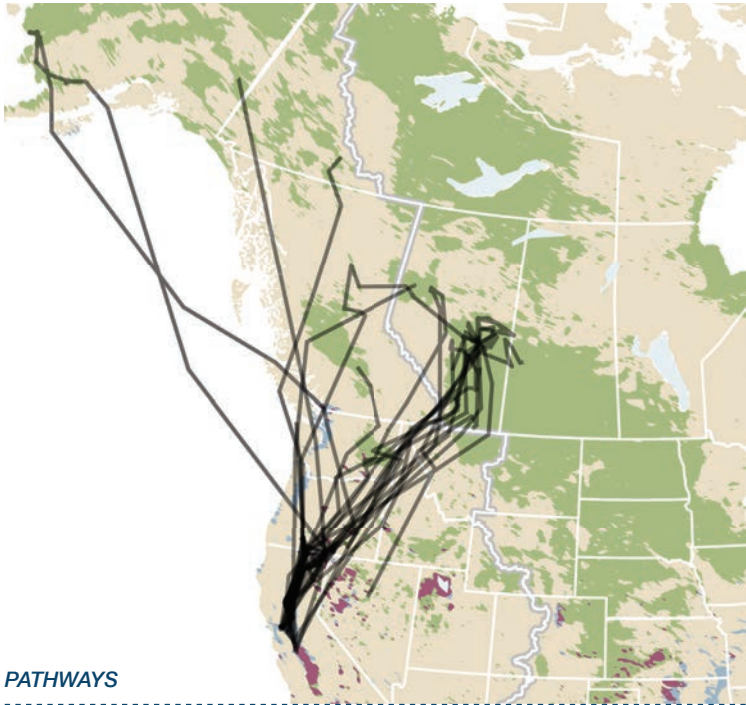
ORDER Anseriformes
FAMILY Anatidae
BREEDING HABITAT Wetlands, Seasonally Wet Grasslands
NONBREEDING HABITAT Wetlands, Generalist
GLOBAL POPULATION SIZE 5,900,000
POPULATION CHANGE SINCE 1970 +188%
IUCN RED LIST CATEGORY Least Concern
R2R TIPPING POINT SPECIES No
US LISTING STATUS No
CANADA SPECIES AT RISK No
PIF CCS 7/20



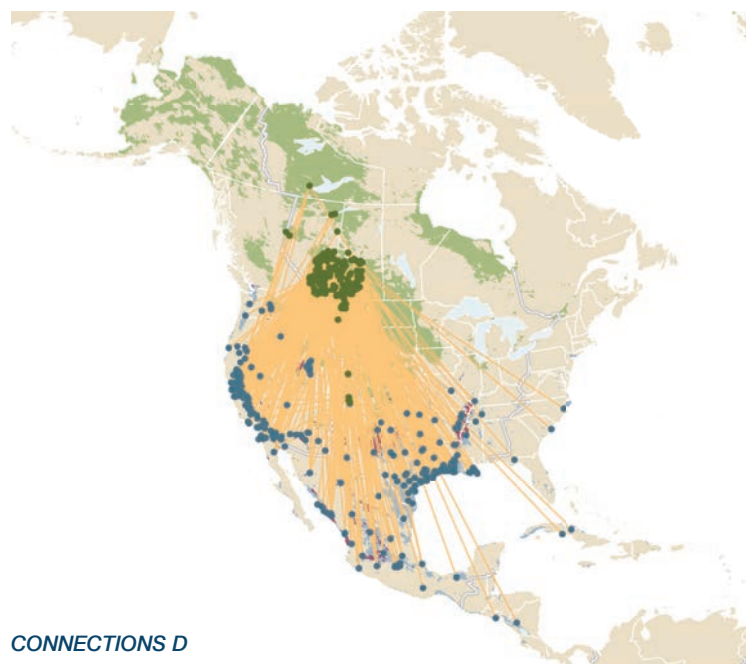
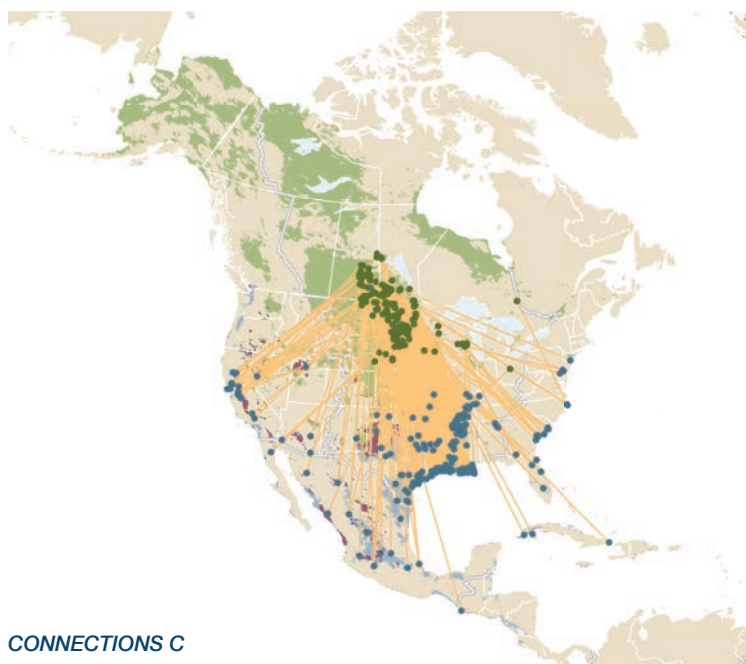
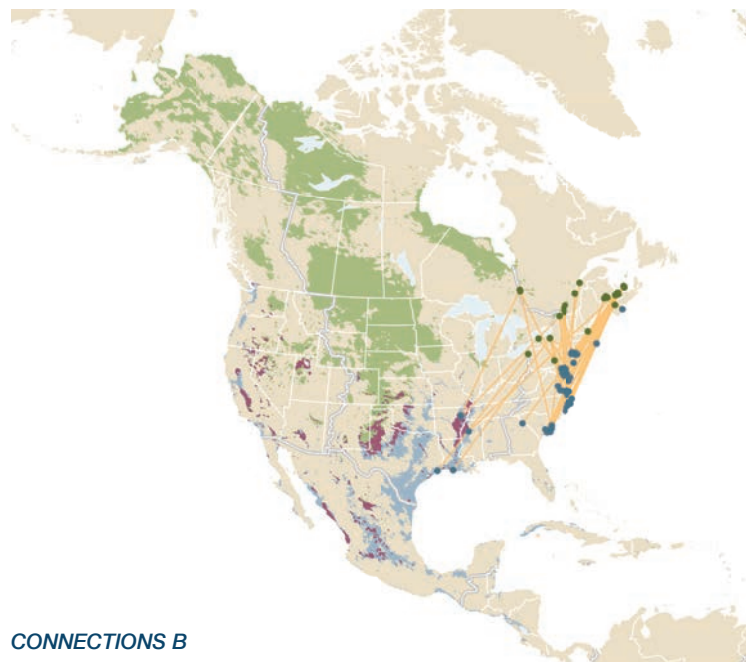
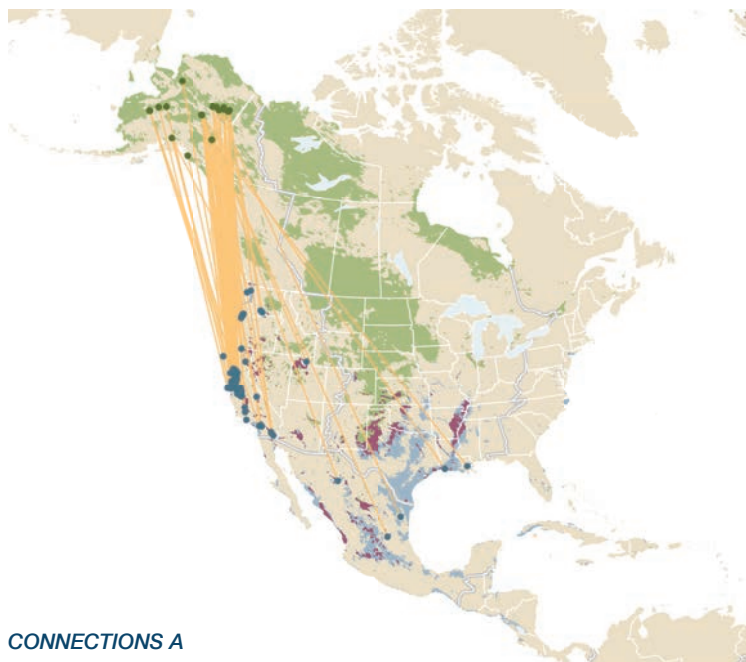
	Atlantic	Caribbean	Central America	Mexico	Midcontinent	Pacific
Atlantic (n = 57)	91%	–	–	–	9%	–
Midcontinent (n = 816)	3%	1%	<1%	13%	38%	44%
Pacific (n = 527)	–	–	–	1%	2%	97%



MIGRATORY CONNECTIVITY
OVERALL Migratory connectivity is known primarily from banding data and limited tracking studies. Most birds breeding in the Atlantic and Pacific flyways migrate within the flyway. However, Midcontinent Flyway breeding birds spread out across nonbreeding areas within the



flyway (38%), as well as to the Pacific Flyway (44%) or Mexico (13%), resulting in weak migratory connectivity (MC = 0.18 ± 0.04).
BANDING Breeding Northern Shovelers were recovered at primary staging and nonbreeding areas, including the Great Salt Lake, the Gulf of Mexico, and the Playa Lakes region (Dubowy et al. 2020).



RADIO TRACKING A few tags were deployed through the Motus Wildlife Tracking System; there were no breeding to nonbreeding detections.

SATELLITE TRACKING Initial results from Northern Shovelers marked during the nonbreeding season in California's Central Valley show migration to breeding areas in the Prairie Pothole Region, Yukon Territories, and Alaska (US Geological Survey, unpublished data).

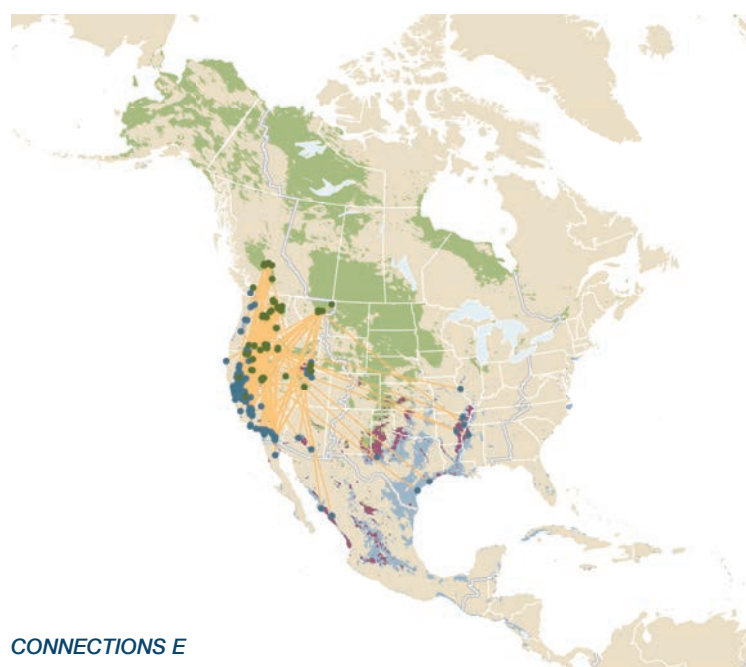
STABLE ISOTOPES Nonbreeding Northern Shovelers on the Great Salt Lake, Utah, were assigned to breeding locations in the western United States and Canada using stable hydrogen isotopes (Roberts and Conover 2015).

GENETICS No genetic studies of migratory connectivity were found for this species

MIGRATORY PATHWAYS Migration occurs through corridors along the Mississippi and Missouri rivers and through the Great Plains (Baldassarre 2014).

DATA CONTRIBUTORS

M. Casazza; C. Feldheim; C. Overton.



DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

GADWALL

Mareca strepera

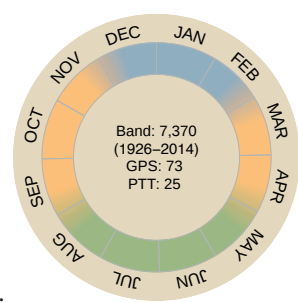
weak

strong

MC = 0.53 ± 0.08*

DISTRIBUTION AND ABUNDANCE

In North America, breeding is concentrated in the Prairie Pothole Region of central Canada to the north-central United States, though also found in western states. The nonbreeding range spans the southern United States, particularly the Mississippi Alluvial Valley, the southern Great Plains, and along the Gulf of Mexico (Leschack et al. 2020).



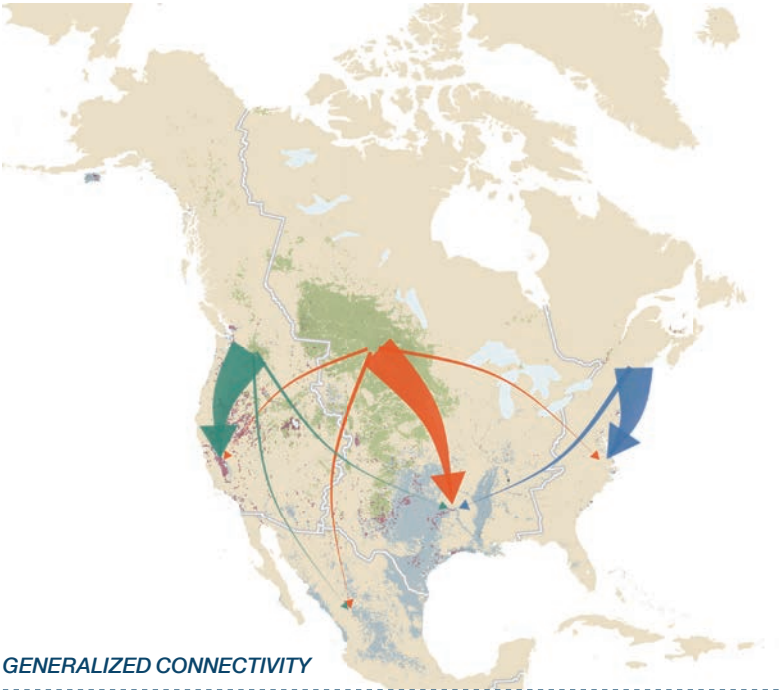
- ORDER Anseriformes
- FAMILY Anatidae
- BREEDING HABITAT Wetlands, Seasonally Wet Grasslands
- NONBREEDING HABITAT Wetlands, Generalist
- GLOBAL POPULATION SIZE 4,400,000
- POPULATION CHANGE SINCE 1970 +204%
- IUCN RED LIST CATEGORY Least Concern
- R2R TIPPING POINT SPECIES No
- US LISTING STATUS No
- CANADA SPECIES AT RISK No
- PIF CCS 8/20

	Atlantic	Caribbean	Mexico	Midcontinent	Pacific
Atlantic (n = 194)	91%	79%	–	9%	–
Midcontinent (n = 2999)	4%	<1%	5%	87%	3%
Pacific (n = 4263)	<1%	–	2%	3%	95%

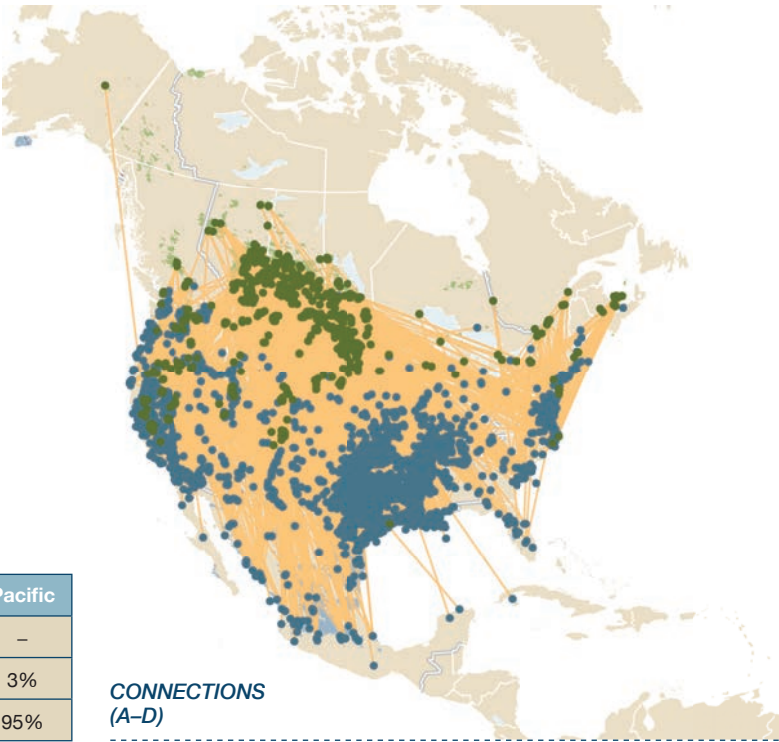
MIGRATORY CONNECTIVITY

OVERALL Migratory connectivity is inferred from banding data and limited satellite transmitter and genetics information, and appears strong within flyways. Transition probability within the Atlantic, Midcontinent, and Pacific flyways is near 90%. Transition probabilities from the Midcontinent, where nearly all Gadwall breed, to the Atlantic Flyway, Pacific Flyway, and Mexico are each about 5%. Resulting MC is one of the strongest of all waterfowl ($MC = 0.53 \pm 0.08$).

BANDING Banding recoveries are extensive, and Gadwall banded on breeding areas in central and eastern North America have been recovered across the species’ nonbreeding range (Baldassarre 2014). Males marked during breeding in Manitoba had a high return rate in subsequent years (Blohm 1978).



GENERALIZED CONNECTIVITY

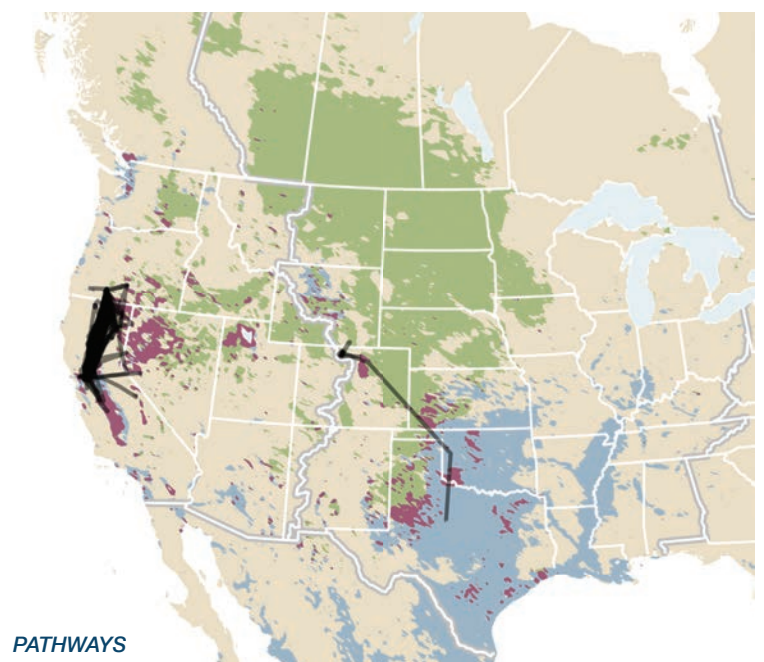
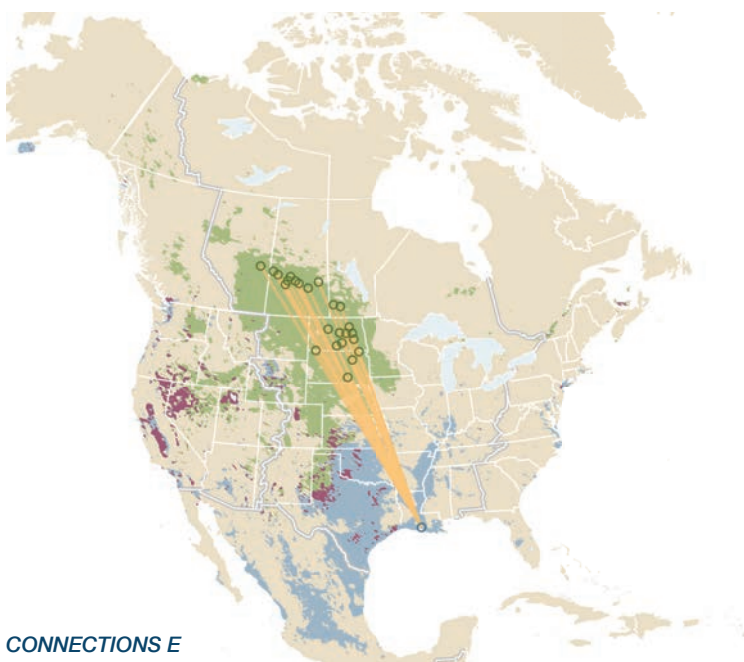
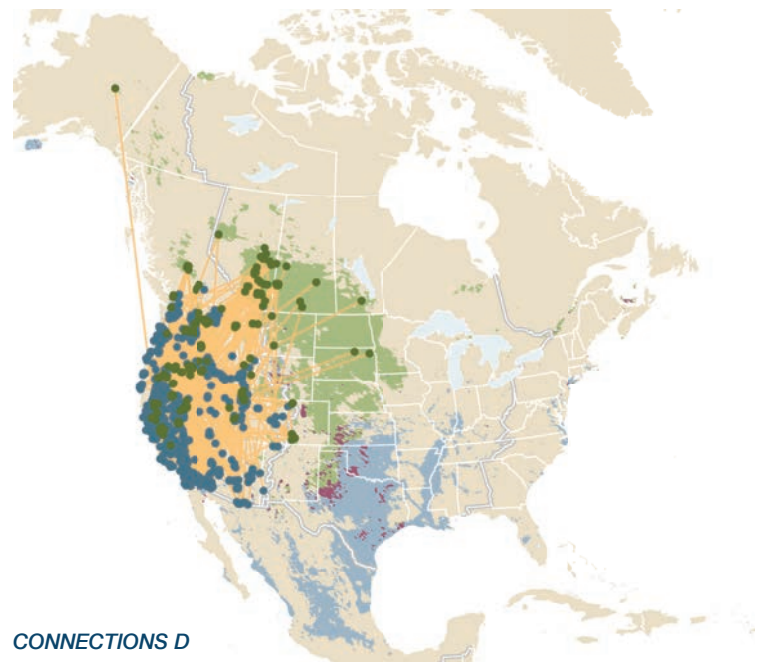
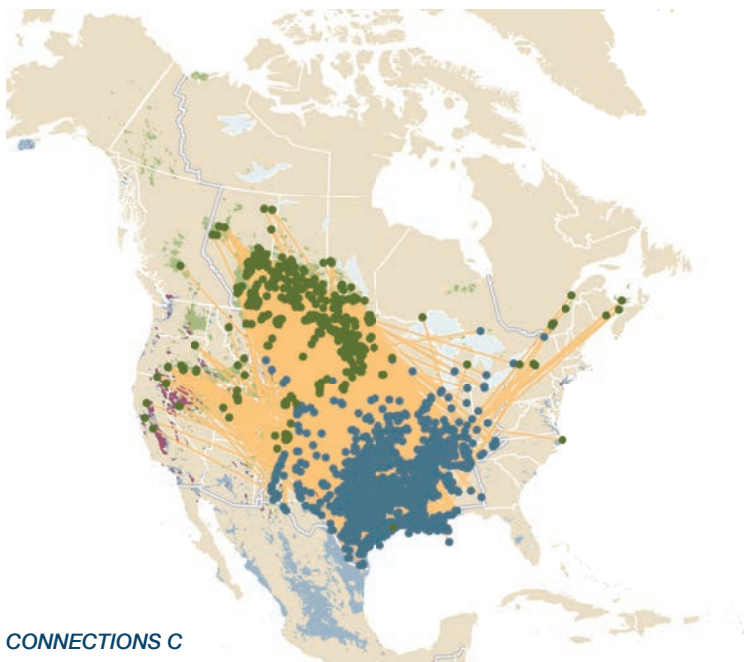
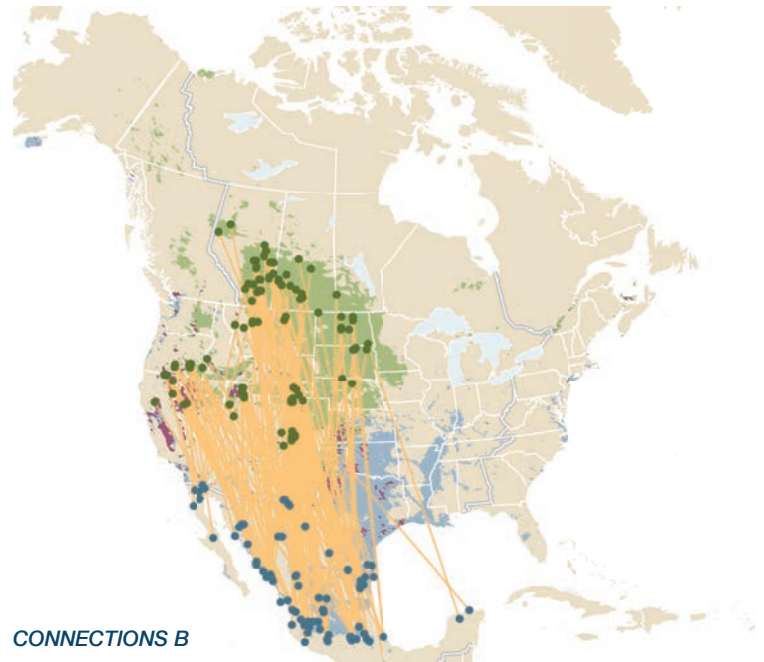
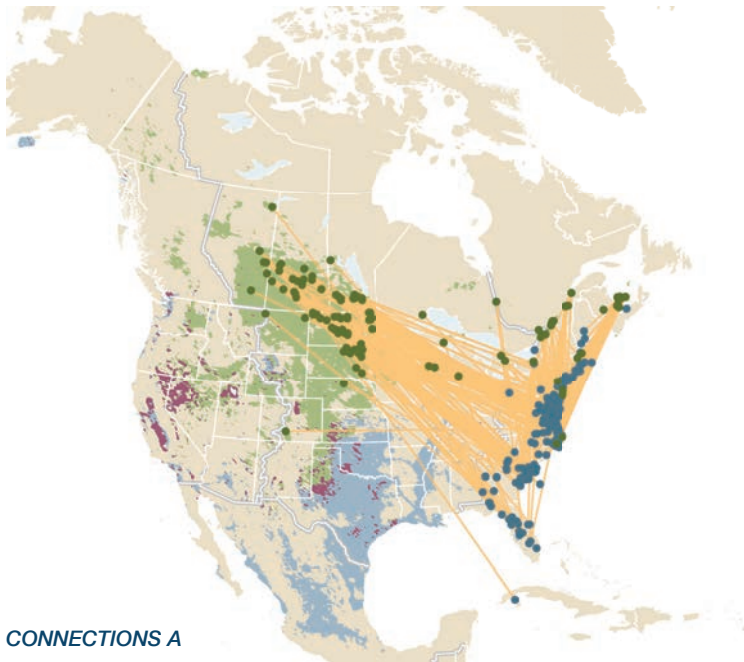


CONNECTIONS (A–D)

RADIO TRACKING Few tags were deployed through the Motus Wildlife Tracking System with local detections only.

SATELLITE TRACKING Female Gadwall (n = 25) were tracked with satellite transmitters from nonbreeding sites along the Gulf Coast of Louisiana and Texas to breeding areas throughout the Prairie Pothole Region (Gray 2010). A few individuals have been tracked by GPS-GSM transmitters in California’s Central Valley and are shown to be residents (US Geological Survey, unpublished data), though molt migration does occur to the Klamath and Great basins (Kohl et al. 2022). A single Gadwall captured in southern Colorado migrated to the playa lakes of Texas (Setash et al., unpublished data).

STABLE ISOTOPES No stable isotope studies of migratory connectivity were found for this species.



DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)

GENETICS Peters and Omland (2007), using mtDNA, found no population structure in North America, though there was some evidence of differentiation between Gadwall sampled on breeding areas in Alaska and Washington versus Gadwall on the remainder of the breeding areas.

DATA CONTRIBUTORS

A. Behney; M. Casazza; C. Feldheim; J.H. Gammonley; J. Gray; D.N. Koons; C. Overton; M. Reddy; C. Setash.

MIGRATION PATHWAYS Birds followed major river systems or moved between areas with high densities of wetlands, which is similar to other dabbling ducks.

INTERESTING NOTE

Eastern expansion of breeding Gadwall in North America during the early 1900s may have been related to increased availability of wetland breeding habitats (Henny and Holgerson 1974).

AMERICAN WIGEON *Mareca americana*

DISTRIBUTION AND ABUNDANCE

American Wigeon breed throughout the Prairie Pothole Region north through the boreal and into Alaska. Birds migrate as far south as Panama in the nonbreeding season, but concentrations occur on lakes in Texas and New Mexico and along the Pacific coast from Washington to Mexico (Fink et al. 2023).



ORDER Anseriformes
FAMILY Anatidae
BREEDING HABITAT Wetlands, Seasonally Wet Grasslands
NONBREEDING HABITAT Wetlands, Generalist
GLOBAL POPULATION SIZE 2,700,000

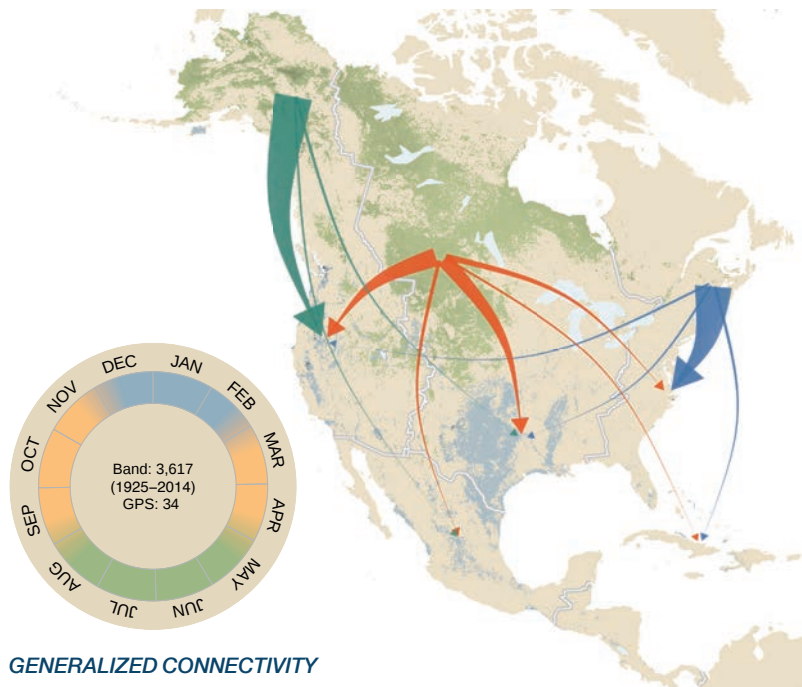
POPULATION CHANGE SINCE 1970 -10%
IUCN RED LIST CATEGORY Least Concern
R2R TIPPING POINT SPECIES No
US LISTING STATUS No
CANADA SPECIES AT RISK No
PIF CCS 10/20

MIGRATORY CONNECTIVITY

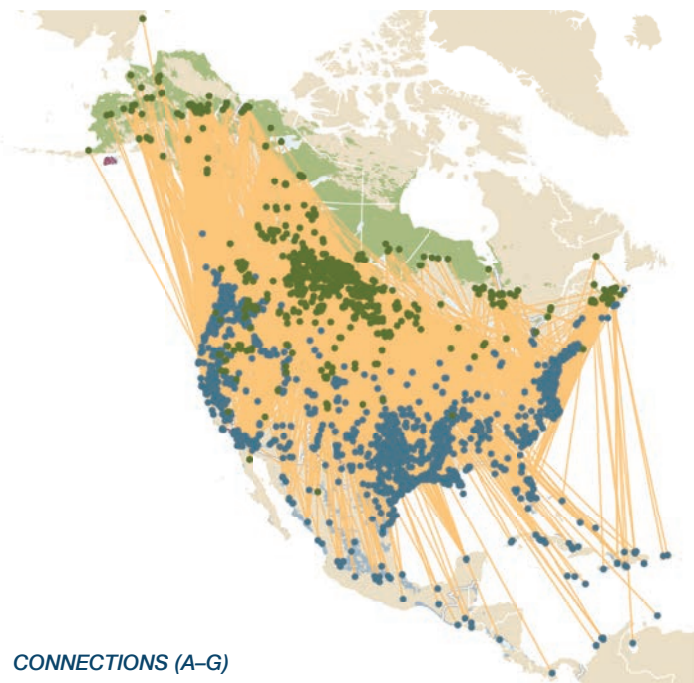
OVERALL Migratory connectivity is known from banding and tracking data; however, tracking data are limited. American Wigeon that were breeding in the two coastal flyways mostly stayed within the same flyway, Atlantic (95%) and Pacific (96%), during the nonbreeding season. Birds breeding in the Midcontinent Flyway moved within the same flyway (37%), but a large percentage migrated to the Pacific Flyway (45%). Despite high transition probabilities within the coastal flyways, movement from breeding areas within the Midcontinent Flyway to all nonbreeding regions leads to moderate migratory connectivity ($MC = 0.21 \pm 0.03$).

BANDING Band returns suggest birds use all four North American flyways during migration (Mini et al. 2020). Of 800 American Wigeon banded during breeding in western Canada, the most common recovery location was California (36%). The remainder were recovered across the species' nonbreeding range in the United States (Baldassarre 2014).

weak | strong
 $MC = 0.21 \pm 0.03^*$

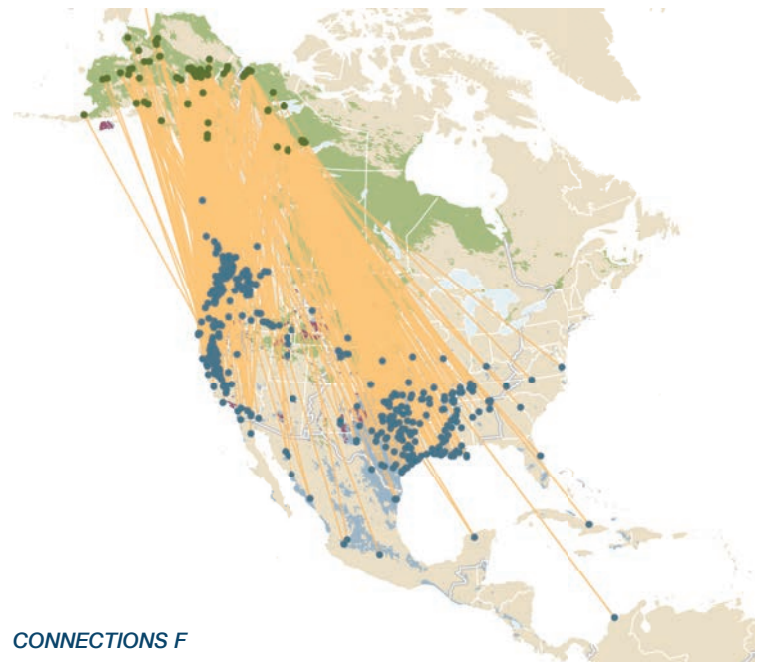
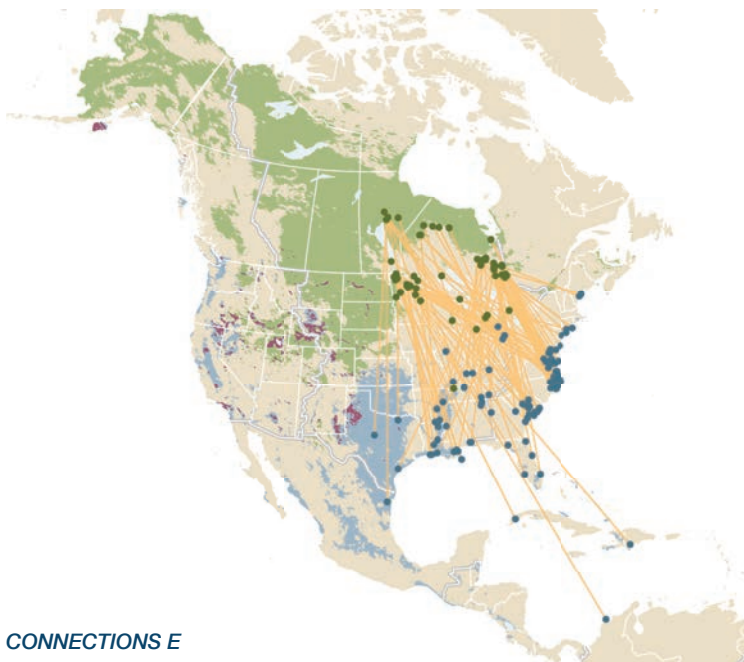
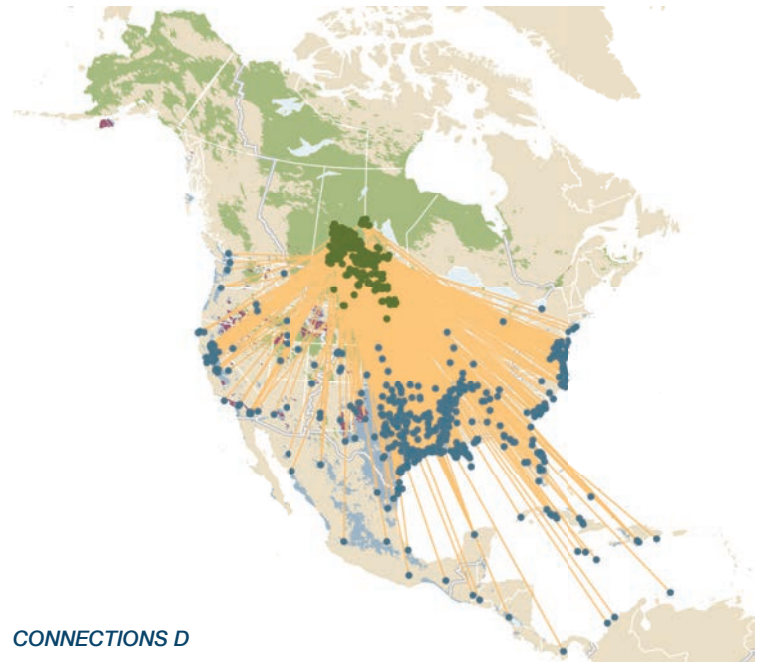
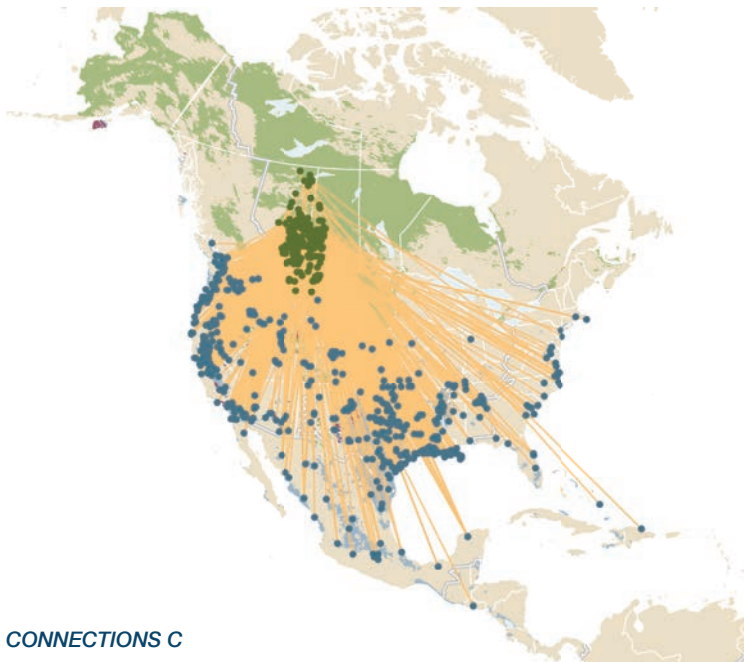
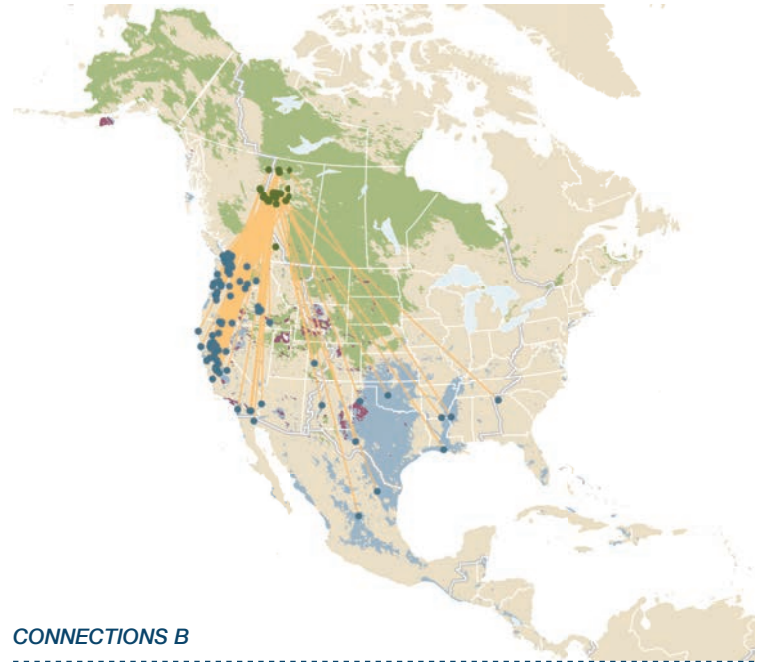
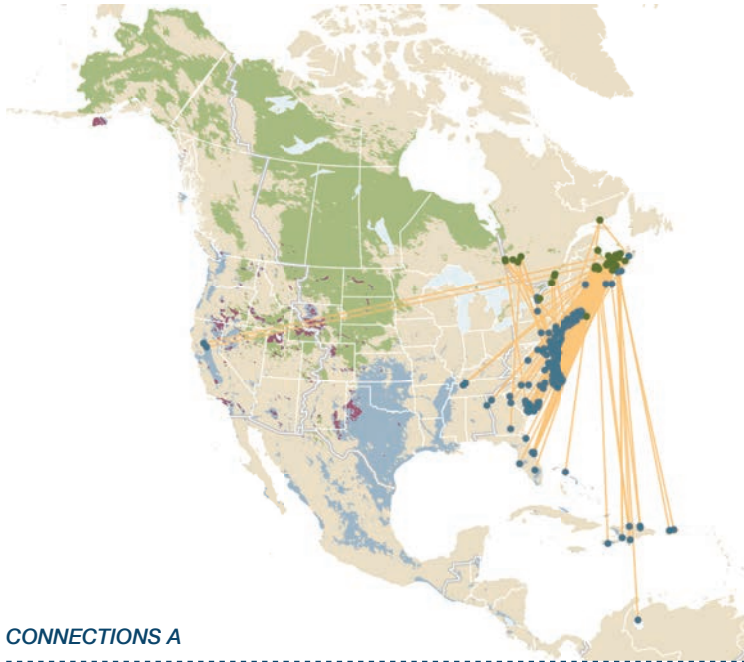


GENERALIZED CONNECTIVITY

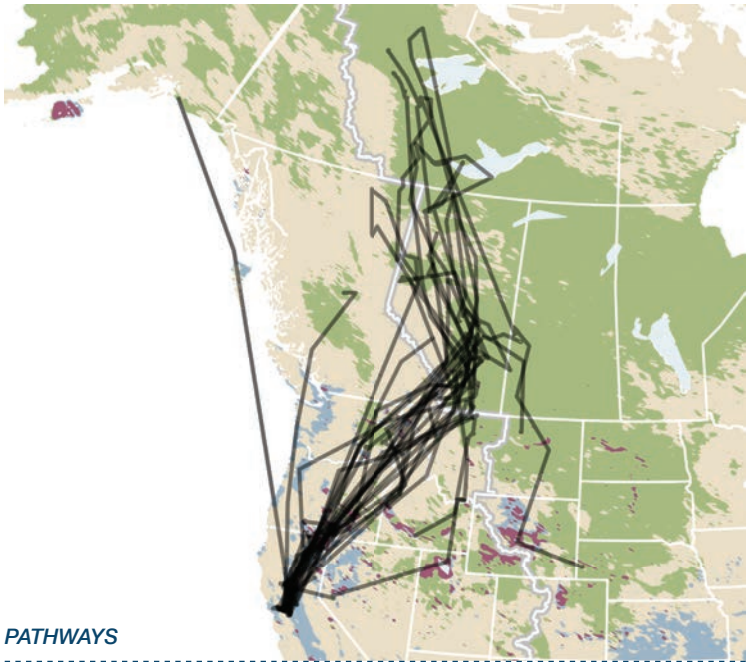
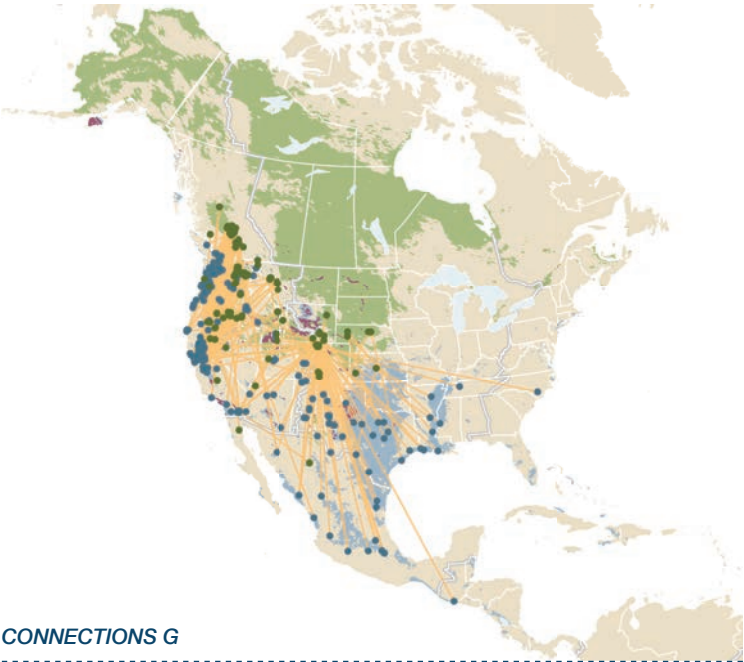


CONNECTIONS (A-G)

	Atlantic	Caribbean	Central America	Mexico	Midcontinent	Northern SA	Pacific
Atlantic (n = 335)	95%	3%	–	–	1%	<1%	1%
Midcontinent (n = 2253)	11%	1%	<1%	5%	37%	<1%	45%
Pacific (n = 1007)	<1%	–	–	1%	3%	<1%	96%



DUCKS, GEESE AND WATERFOWL (ANSERIFORMES)



SATELLITE TRACKING Birds marked during the nonbreeding season in the Central Valley of California migrated to breeding areas in Alaska, the western boreal forest, and the Northwest Territories (US Geological Survey, unpublished data). Some birds subsequently spent the nonbreeding season in the Central Flyway.

STABLE ISOTOPES Most (85%) American Wigeon sampled in central Saskatchewan during post-breeding migration originated in northern tundra breeding areas (Asante et al. 2017).

GENETICS Genetic variation of American Wigeon collected in the Texas panhandle (n = 629) showed temporal changes through the nonbreeding season (Rhodes et al. 1993). This suggests there is some

genetic differentiation among breeding populations due to differential arrival to nonbreeding areas.

MIGRATORY PATHWAYS American Wigeon are most abundant in western North America during breeding and nonbreeding periods, making a general north-south migration most likely. They are one of the more northerly breeding dabbling ducks; birds breeding across western North America migrate to the Pacific coast through interior wetlands, while more central breeding birds migrate south to nonbreeding areas in the southern Great Plains and Mississippi Alluvial Valley, jumping between major wetlands or following river systems (Baldasarre 2014).

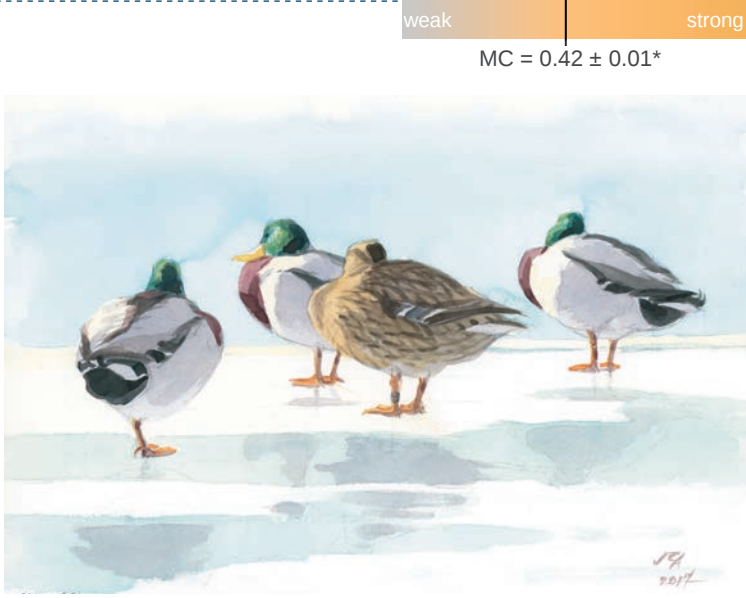
DATA CONTRIBUTORS
M. Casazza; C. Overton; C. Feldheim.

MALLARD *Anas platyrhynchos*

DISTRIBUTION AND ABUNDANCE
Mallards are widespread and found year-round throughout the continental United States, extending into Mexico in the nonbreeding season and breeding throughout Canada and Alaska (Drilling et al. 2020). They are a partial to medium-distance migrant. Highest breeding concentrations are found in the Prairie Pothole Region, and nonbreeding concentrations in the southeast and central United States.

ORDER Anseriformes	POPULATION CHANGE
FAMILY Anatidae	SINCE 1970 +37%
BREEDING HABITAT Wetlands, Generalist	IUCN RED LIST CATEGORY Least Concern
NONBREEDING HABITAT Wetlands, Generalist	R2R TIPPING POINT SPECIES No
GLOBAL POPULATION	US LISTING STATUS No
SIZE 19,000,000	CANADA SPECIES AT RISK No
	PIF CCS 7/20

MIGRATORY CONNECTIVITY
OVERALL More bands have been put on Mallards than any other bird species in North America. In addition, satellite transmitter, stable isotope, and genetic data are available throughout its range. Mixing occurs across the range, but transition rates are high within



the three flyways, Atlantic (75%), Midcontinent (75%), and Pacific (98%). Movement from the Midcontinent to the Pacific flyway (20%) and from the Atlantic to the Midcontinent flyway (25%) is also common. Migratory connectivity is relatively strong for Mallards (MC = 0.42 ± 0.01).

A

Acadian Flycatcher (*Empidonax virens*), 544
 Ainley's Storm-Petrel (*Hydrobates cheimomnestes*), 381–382
 Albatrosses, Petrels, and Shearwaters (Procellariiformes)
 Albatrosses (Diomedidae)
 Black-footed Albatross (*Phoebastria nigripes*), 4, 371–373
 Laysan Albatross (*Phoebastria immutabilis*), 4, 367–371
 Short-tailed Albatross (*Phoebastria albatrus*), 366, 374–376
 Northern Storm-Petrels (Hydrobatidae)
 Ainley's Storm-Petrel (*Hydrobates cheimomnestes*), 381–382
 Ashy Storm-Petrel (*Hydrobates homochroa*), 382
 Band-rumped Storm-Petrel (*Hydrobates castro*), 366, 383
 Black Storm-Petrel (*Hydrobates melania*), 366, 383
 Fork-tailed Storm-Petrel (*Hydrobates furcatus*), 377–378
 Leach's Storm-Petrel (*Hydrobates leucorhous*), 378–380
 Least Storm-Petrel (*Hydrobates microsoma*), 366, 384
 Townsend's Storm-Petrel (*Hydrobates socorroensis*), 381
 Tristram's Storm-Petrel (*Hydrobates tristrami*), 366, 384
 overview of, 366
 Shearwaters and Petrels (Procellariidae)
 Bermuda Petrel (*Pterodroma cahow*), 366, 390
 Black-capped Petrel (*Pterodroma hasitata*), 366, 390–391
 Black-vented Shearwater (*Puffinus opisthomelas*), 413–414
 Black-winged Petrel (*Pterodroma nigripennis*), 366, 394
 Bonin Petrel (*Pterodroma hypoleuca*), 366, 393–394
 Buller's Shearwater (*Ardenna bulleri*), 366, 402
 Bulwer's Petrel (*Bulweria bulwerii*), 398
 Christmas Shearwater (*Puffinus nativitatis*), 366, 410
 Cook's Petrel (*Pterodroma cookii*), 366, 397–398
 Cory's Shearwater (*Calonectris borealis*), 399–400
 Desertas Petrel (*Pterodroma desertas*), 395–396
 Fea's Petrel (*Pterodroma feae*), 366, 395, 396
 Flesh-footed Shearwater (*Ardenna carneipes*), 366, 409
 Great Shearwater (*Ardenna gravis*), 406–407
 Hawaiian Petrel (*Pterodroma sandwichensis*), 366, 392–393
 Juan Fernandez Petrel (*Pterodroma externa*), 366, 392–393
 Manx Shearwater (*Puffinus puffinus*), 366, 410–411
 Mottled Petrel (*Pterodroma inexpectata*), 366, 389
 Murphy's Petrel (*Pterodroma ultima*), 388–389
 Newell's Shearwater (*Puffinus newelli*), 412–413
 Northern Fulmar (*Fulmarus glacialis*), 385–387
 Pink-footed Shearwater (*Ardenna creatopus*), 366, 408–409
 Sargasso Shearwater (*Puffinus lherminieri*), 366, 414
 Short-tailed Shearwater (*Ardenna tenuirostris*), 402–403
 Sooty Shearwater (*Ardenna grisea*), 404–406
 Townsend's Shearwater (*Puffinus auricularis*), 411–412, 413
 Trindade Petrel (*Pterodroma arminjoniana*), 387–388
 Wedge-tailed Shearwater (*Ardenna pacifica*), 400–401
 Southern Storm-Petrels (Oceanitidae)
 White-faced Storm-Petrel (*Pelagodroma marina*), 366, 377
 Wilson's Storm-Petrel (*Oceanites oceanicus*), 366, 376
 Alder Flycatcher (*Empidonax alnorum*), 544
 Aleutian Cackling Goose (*Branta hutchinsii leucopareia*), 48
 Aleutian Tern (*Onychoprion aleuticus*), 322–323
 Allen's Hummingbird (*Selasphorus sasin*), 129, 138–139
 American Avocet (*Recurvirostra americana*), 160
 American Barn Owl (*Tyto furcata*), 496, 497
 American Bittern (*Botaurus lentiginosus*), 440–441

American Black Duck (*Anas rubripes*), 73–77
 American Common Eider (*Somateria mollissima dresseri*), 92, 93
 American Coot (*Fulica americana*), 148–149
 American Crow (*Corvus brachyrhynchos*), 562–563
 American Golden-Plover (*Pluvialis dominica*), 166–167
 American Goldfinch (*Spinus tristis*), 618–619
 American Goshawk (*Accipiter atricapillus*), 463, 474–476
 American Kestrel (*Falco sparverius*), 518, 519–520
 American Oystercatcher (*Haematopus palliatus*), 2, 161–162
 American Pipit (*Anthus rubescens*), 607
 American Redstart (*Setophaga ruticilla*), 2, 530, 531, 689–690
 American Robin (*Turdus migratorius*), 4, 10, 11, 600–602
 American Tree Sparrow (*Spizelloides arborea*), 633
 American White Pelican (*Pelecanus erythrorhynchos*), 433, 434–436
 American Wigeon (*Mareca americana*), 68–70
 American Woodcock (*Scolopax minor*), 213–215
 Ancient Murrelet (*Synthliboramphus antiquus*), 261–263
 Anhinga (*Anhinga anhinga*), 417, 425–426. *See also* Frigatebirds, Boobies, Gannets, Anhingas, and Cormorants (Suliformes)
 Anna's Hummingbird (*Calypte anna*), 136
 Antillean Nighthawk (*Chordeiles gundlachii*), 123
 Aplomado Falcon (*Falco femoralis*), 518, 522–523
 Arctic Loon (*Gavia arctica*), 356, 359–360
 Arctic Tern (*Sterna paradisaea*), 1–2, 4, 335–337
 Arctic Warbler (*Phylloscopus borealis*), 573
 Ash-throated Flycatcher (*Myiarchus cinerascens*), 533
 Ashy Storm-Petrel (*Hydrobates homochroa*), 382
 Atlantic Brant (*Branta bernicla hrota*), 45, 46
 Atlantic Canada Goose (*Branta canadensis canadensis*), 52
 Atlantic Puffin (*Fratercula arctica*), 271–274
 Auks. *See* Shorebirds, Auks, Gulls, and Terns (Charadriiformes)

B

Bachman's Sparrow (*Peucaea aestivalis*), 624
 Baird's Sandpiper (*Calidris bairdii*), 199
 Baird's Sparrow (*Centronyx bairdii*), 644–645
 Bald Eagle (*Haliaeetus leucocephalus*), 12, 463, 478–480
 Baltimore Oriole (*Icterus galbula*), 660
 Band-rumped Storm-Petrel (*Hydrobates castro*), 366, 383
 Band-tailed Pigeon (*Patagioenas fasciata*), 110–112
 Bank Swallow (*Riparia riparia*), 565
 Barn Swallow (*Hirundo rustica*), 22, 531, 570–571
 Barrow's Goldeneye (*Bucephala islandica*), 103–104
 Bar-tailed Godwit (*Limosa lapponica baueri*), 183
 Bay-breasted Warbler (*Setophaga castanea*), 695–696
 Bell's Sparrow (*Artemesiospiza belli*), 640
 Bell's Vireo (*Vireo bellii*), 553
 Belted Kingfisher (*Megasceryle alcyon*), 510
 Bendire's Thrasher (*Toxostoma bendirei*), 585
 Bermuda Petrel (*Pterodroma cahow*), 366, 390
 Bewick's Wren (*Thryomanes bewickii*), 579
 Bicknell's Thrush (*Catharus bicknelli*), 593–594
 Bitterns. *See* Pelicans, Herons, Egrets, Bitterns, Ibises, and Spoonbills (Pelecaniformes)
 Black-and-white Warbler (*Mniotilta varia*), 677–678
 Black-bellied Plover (*Pluvialis squatarola*), 12, 164–165

INDEX

Black-bellied Whistling-Duck (*Dendrocygna autumnalis*), 34
 Black-billed Cuckoo (*Coccyzus erythrophthalmus*), 119
 Blackbirds. *See* New World Blackbirds and Allies (Icteridae)
 Black Brant (*Branta bernicla nigricans*), 45, 46
 Blackburnian Warbler (*Setophaga fusca*), 696
 Black-capped Petrel (*Pterodroma hasitata*), 366, 390–391
 Black-capped Vireo (*Vireo atricapilla*), 552
 Black-chinned Hummingbird (*Archilochus alexandri*), 135
 Black-chinned Sparrow (*Spizella atrogularis*), 630
 Black-crowned Night Heron (*Nycticorax nycticorax*), 6–7, 10, 12, 433, 446–448
 Black-footed Albatross (*Phoebastria nigripes*), 4, 371–373
 Black Guillemot (*Cephus grylle*), 252–254
 Black-headed Grosbeak (*Pheucticus melanocephalus*), 716
 Black-legged Kittiwake (*Rissa tridactyla*), 277–283
 Black-necked Stilt (*Himantopus mexicanus*), 159
 Black Noddy (*Anous minutus*), 317–318
 Black Oystercatcher (*Haematopus bachmani*), 162–163
 Black Phoebe (*Sayoris nigricans*), 549
 Blackpoll Warbler (*Setophaga striata*), 4, 531, 698–699
 Black Rail (*Laterallus jamaicensis*), 142, 152
 Black Rosy-Finch (*Leucosticte atrata*), 610
 Black Scoter (*Melanitta americana*), 33, 98–99
 Black Skimmer (*Rynchops niger*), 343–345
 Black Storm-Petrel (*Hydrobates melania*), 366, 383
 Black Swift (*Cypseloides niger*), 129, 130
 Black Tern (*Chlidonias niger*), 328–329
 Black-throated Blue Warbler (*Setophaga caerulescens*), 21, 700–701
 Black-throated Gray Warbler (*Setophaga nigrescens*), 706
 Black-throated Green Warbler (*Setophaga virens*), 708
 Black-throated Sparrow (*Amphispiza bilineata*), 626
 Black Turnstone (*Arenaria melanocephala*), 188–189
 Black-vented Shearwater (*Puffinus opisthomelas*), 413–414
 Black Vulture (*Coragyps atratus*), 459–460
 Black-whiskered Vireo (*Vireo altiloquus*), 559
 Black-winged Petrel (*Pterodroma nigripennis*), 366, 394
 Blue-gray Gnatcatcher (*Poliophtila caerulea*), 578
 Blue Grosbeak (*Passerina caerulea*), 717
 Blue-headed Vireo (*Vireo solitarius*), 555
 Blue Jay (*Cyanocitta cristata*), 561–562
 Bluethroat (*Luscinia svecica*), 604
 Blue-throated Mountain-gem (*Lampornis clemenciae*), 133
 Blue-winged Teal (*Spatula discors*), 58–61
 Blue-winged Warbler (*Vermivora cyanoptera*), 676–677
 Boat-tailed Grackle (*Quiscalus major*), 670
 Bobolink (*Dolichonyx oryzivorus*), 2, 654–655
 Bohemian Waxwing (*Bombycilla garrulus*), 574–575
 Bonaparte's Gull (*Chroicocephalus philadelphia*), 289–290
 Bonin Petrel (*Pterodroma hypoleuca*), 366, 393–394
 Boobies. *See* Frigatebirds, Boobies, Gannets, Anhingas, and Cormorants (Suliformes)
 Botteri's Sparrow (*Peucaea botterii*), 623
 Brandt's Cormorant (*Urile penicillatus*), 426–427
 Brant (*Branta bernicla*), 45–47
 Brewer's Blackbird (*Euphagus cyanocephalus*), 667–668
 Brewer's Sparrow (*Spizella breweri*), 631
 Bridled Tern (*Onychoprion anaethetus*), 322
 Bristle-thighed Curlew (*Numenius tahitiensis*), 178–179
 Broad-billed Hummingbird (*Lampornis clemenciae*), 140
 Broad-tailed Hummingbird (*Selasphorus platycercus*), 139
 Broad-winged Hawk (*Buteo platypterus*), 463, 484–485
 Bronzed Cowbird (*Molothrus aeneus*), 664
 Brown Booby (*Sula leucogaster*), 421–422

Brown-capped Rosy-Finch (*Leucosticte australis*), 611
 Brown Creeper (*Certhia americana*), 577–578
 Brown-crested Flycatcher (*Myiarchus tyrannulus*), 534
 Brown-headed Cowbird (*Molothrus ater*), 664–665
 Brown Noddy (*Anous stolidus*), 316
 Brown Pelican (*Pelecanus occidentalis*), 13, 433, 436–439
 Brown Thrasher (*Toxostoma rufum*), 584–585
 Buff-bellied Hummingbird (*Amazilia yucatanensis*), 141
 Buff-breasted Flycatcher (*Empidonax fulvifrons*), 549
 Buff-breasted Sandpiper (*Calidris subruficollis*), 202–203
 Buff-collared Nightjar (*Antrostomus ridgwayi*), 125
 Bufflehead (*Bucephala albeola*), 101
 Buller's Shearwater (*Ardenna bulleri*), 366, 402
 Bullock's Oriole (*Icterus bullockii*), 659
 Bulwer's Petrel (*Bulweria bulwerii*), 366, 398
 Burrowing Owl (*Athene cunicularia*), 496, 502–503

C

Cackling Goose (*Branta hutchinsii*), 47–48
 California Gull (*Larus californicus*), 302–303
 Calliope Hummingbird (*Selasphorus calliope*), 137
 Canada Goose (*Branta canadensis*), 49–52
 Canada Warbler (*Cardellina canadensis*), 530, 531, 709–710
 Canvasback (*Aythya valisineria*), 80–81
 Cape May Warbler (*Setophaga tigrina*), 692
 Caspian Tern (*Hydroprogne caspia*), 326–327
 Cassin's Auklet (*Ptychoramphus aleuticus*), 263–265
 Cassin's Finch (*Haemorhous cassinii*), 613
 Cassin's Kingbird (*Tyrannus vociferans*), 536
 Cassin's Sparrow (*Peucaea cassinii*), 624
 Cassin's Vireo (*Vireo cassinii*), 555
 Cave Swallow (*Petrochelidon fulva*), 572
 Cedar Waxwing (*Bombycilla cedrorum*), 5, 575–576
 Cerulean Warbler (*Setophaga cerulea*), 531, 692–693
 Chestnut-collared Longspur (*Calcarius ornatus*), 620
 Chestnut-sided Warbler (*Setophaga pennsylvatica*), 698
 Chihuahuan Meadowlark (*Sturnella liliana*), 655
 Chimney Swift (*Chaetura pelagica*), 129, 131
 Chipping Sparrow (*Spizella passerina*), 628–629
 Christmas Shearwater (*Puffinus nativitatis*), 366, 410
 Chuck-will's-widow (*Antrostomus carolinensis*), 124–125
 Cinnamon Teal (*Spatula cyanoptera*), 62–63
 Clapper Rail (*Rallus crepitans*), 142, 144–145
 Clark's Grebe (*Aechmophorus clarkii*), 346, 351
 Clay-colored Sparrow (*Spizella pallida*), 629
 Cliff Swallow (*Petrochelidon pyrrhonota*), 571–572
 Colima Warbler (*Leiothlypis crissalis*), 682
 Common Black Hawk (*Buteogallus anthracinus*), 481–482
 Common Eider (*Somateria mollissima*), 12, 13, 92–93
 Common Gallinule (*Gallinula galeata*), 142, 147
 Common Goldeneye (*Bucephala clangula*), 102
 Common Grackle (*Quiscalus quiscula*), 668–669
 Common Loon (*Gavia immer*), 19, 356, 362–364
 Common Merganser (*Mergus merganser*), 105–106
 Common Murre (*Uria aalge*), 241–244
 Common Nighthawk (*Chordeiles minor*), 120, 121–123
 Common Poorwill (*Phalaenoptilus nuttallii*), 124
 Common Ringed Plover (*Charadrius hiaticula*), 170
 Common Tern (*Sterna hirundo*), 331–335
 Common Yellowthroat (*Geothlypis trichas*), 21, 530, 687–688

Connecticut Warbler (*Oporornis agilis*), 531, 684–685
 Cook's Petrel (*Pterodroma cookii*), 366, 397–398
 Cooper's Hawk (*Accipiter cooperii*), 463, 473–474
 Coots. *See* Rails, Coots, and Cranes (Gruiformes)
 Cormorants. *See* Frigatebirds, Boobies, Gannets, Anhingas, and Cormorants (Suliformes)
 Cory's Shearwater (*Calonectris borealis*), 399–400
 Costa's Hummingbird (*Calypte costae*), 136
 Couch's Kingbird (*Tyrannus couchii*), 535
 Cranes. *See* Rails, Coots, and Cranes (Gruiformes)
 Craveri's Murrelet (*Synthliboramphus craveri*), 261
 Crested Auklet (*Aethia cristatella*), 268
 Cuckoos (Cuculiformes), 116
 Cuculidae
 Black-billed Cuckoo (*Coccyzus erythrophthalmus*), 119
 Groove-billed Ani (*Crotophaga sulcirostris*), 116
 Yellow-billed Cuckoo (*Coccyzus americanus*), 117–118

D

Dark-eyed Junco (*Junco hyemalis*), 531, 634–635
 Desert Petrel (*Pterodroma desertas*), 395–396
 Dickcissel (*Spiza americana*), 722
 Double-crested Cormorant (*Nannopterum auritum*), 417, 430–432
 Dovekie (*Alle alle*), 240–241
 Ducks, Geese, and Waterfowl (Anseriformes)
 Anatidae
 American Black Duck (*Anas rubripes*), 73–77
 American Wigeon (*Mareca americana*), 68–70
 Barrow's Goldeneye (*Bucephala islandica*), 103–104
 Black-bellied Whistling-Duck (*Dendrocygna autumnalis*), 34
 Black Scoter (*Melanitta americana*), 33, 98–99
 Blue-winged Teal (*Spatula discors*), 58–61
 Brant (*Branta bernicla*), 45–47
 Bufflehead (*Bucephala albeola*), 101
 Cackling Goose (*Branta hutchinsii*), 47–48
 Canada Goose (*Branta canadensis*), 49–52
 Canvasback (*Aythya valisineria*), 80–81
 Cinnamon Teal (*Spatula cyanoptera*), 62–63
 Common Eider (*Somateria mollissima*), 12, 13, 92–93
 Common Goldeneye (*Bucephala clangula*), 102
 Common Merganser (*Mergus merganser*), 105–106
 Emperor Goose (*Anser canagicus*), 36–37
 Fulvous Whistling-Duck (*Dendrocygna bicolor*), 35
 Gadwall (*Mareca strepera*), 66–68
 Greater Scaup (*Aythya manila*), 85
 Greater White-fronted Goose (*Anser albifrons*), 33, 43–44
 Green-winged Teal (*Anas crecca*), 5, 78–80
 Harlequin Duck (*Histrionicus histrionicus*), 94–95
 Hooded Merganser (*Lophodytes cucullatus*), 104–105
 King Eider (*Somateria spectabilis*), 33, 90–91
 Lesser Scaup (*Aythya affinis*), 86–87
 Long-tailed Duck (*Clangula hyemalis*), 33, 99–100
 Mallard (*Anas platyrhynchos*), 33, 70–73
 Northern Pintail (*Anas acuta*), 33, 75–77
 Northern Shoveler (*Spatula clypeata*), 33, 64–65
 overview of, 33
 Red-breasted Merganser (*Mergus serrator*), 106–107
 Redhead (*Aythya americana*), 82
 Ring-necked Duck (*Aythya collaris*), 83–84
 Ross's Goose (*Anser rossii*), 41–42

Ruddy Duck (*Oxyura jamaicensis*), 107–108
 Snow Goose (*Anser caerulescens*), 33, 37–40
 Spectacled Eider (*Somateria fischeri*), 33, 89–90
 Steller's Eider (*Polysticta stelleri*), 33, 88–89
 Surf Scoter (*Melanitta perspicillata*), 95–96
 Trumpeter Swan (*Cygnus buccinator*), 12, 13, 53–54
 Tundra Swan (*Cygnus columbianus*), 54–55
 White-winged Scoter (*Melanitta deglandi*), 96–97
 Wood Duck (*Aix sponsa*), 56–58
 Dunlin (*Calidris alpina*), 195–197
 Dusky Canada Goose (*Branta canadensis occidentalis*), 51
 Dusky Flycatcher (*Empidonax oberholseri*), 547
 Dusky-capped Flycatcher (*Myiarchus tuberculifer*), 532

E

Eagles. *See* Hawks, Eagles, Kites, and Osprey (Accipitriformes)
 Eared Grebe (*Podiceps nigricollis*), 348–349
 Eastern Bluebird (*Sialia sialis*), 4, 587–588
 Eastern Kingbird (*Tyrannus tyrannus*), 538–539
 Eastern Meadowlark (*Sturnella magna*), 656–657
 Eastern Phoebe (*Sayornis phoebe*), 550
 Eastern Towhee (*Pipilo erythrophthalmus*), 651–652
 Eastern Whip-poor-will (*Antrostomus vociferus*), 124, 126–127
 Eastern Wood-Pewee (*Contopus virens*), 543
 Eastern Yellow Wagtail (*Motacilla tschutschensis*), 606
 Egrets. *See* Pelicans, Herons, Egrets, Bitterns, Ibises, and Spoonbills (Pelecaniformes)
 Elegant Tern (*Thalasseus elegans*), 342–343
 Elegant Trogon (*Trogon elegans*), 509
 Elf Owl (*Micrathene whitneyi*), 501
 Emperor Goose (*Anser canagicus*), 36–37
 Evening Grosbeak (*Coccothraustes vespertinus*), 608–609

F

Falcons and Caracaras (Falconiformes)
 Falcons and Caracaras (Falconidae)
 American Kestrel (*Falco sparverius*), 518, 519–520
 Aplomado Falcon (*Falco femoralis*), 518, 522–523
 Gyr Falcon (*Falco rusticolus*), 518, 523–524
 Merlin (*Falco columbarius*), 518, 521–522
 Peregrine Falcon (*Falco peregrinus*), 518, 524–528
 Prairie Falcon (*Falco mexicanus*), 518, 528–529
 overview of, 518
 Fea's Petrel (*Pterodroma feae*), 366, 395, 396
 Ferruginous Hawk (*Buteo regalis*), 493–495
 Field Sparrow (*Spizella pusilla*), 630–631
 Fish Crow (*Corvus ossifragus*), 563
 Flammulated Owl (*Psilosops flammeolus*), 498–499
 Flycatchers. *See* Tityras and Allies (Tityridae)
 Flesh-footed Shearwater (*Ardenna carneipes*), 366, 409
 Fork-tailed Storm-Petrel (*Hydrobates furcatus*), 377–378
 Forster's Tern (*Sterna forsteri*), 337–338
 Fox Sparrow (*Passerella iliaca*), 21, 632–633
 Franklin's Gull (*Leucophaeus pipixcan*), 294–295
 Frigatebirds, Boobies, Gannets, Anhingas, and Cormorants (Suliformes)
 Anhingas (Anhingidae)
 Anhinga (*Anhinga anhinga*), 417, 425–426

INDEX

Frigatebirds, Boobies, Gannets, Anhingas, and Cormorants (Suliformes)

continued

Boobies and Gannets (Sulidae)

Brown Booby (*Sula leucogaster*), 421–422

Masked Booby (*Sula dactylatra*), 419–420

Northern Gannet (*Morus bassanus*), 417, 423–425

Cormorants and Shags (Phalacrocoracidae)

Brandt's Cormorant (*Urile penicillatus*), 426–427

Double-crested Cormorant (*Nannopterum auritum*), 417, 430–432

Great Cormorant (*Phalacrocorax carbo*), 429

Pelagic Cormorant (*Urile pelagicus*), 417, 427–428

Frigatebirds (Fregatidae)

Magnificent Frigatebird (*Fregata magnificens*), 13, 417, 418–419

overview of, 417

Fulvous Whistling-Duck (*Dendrocygna bicolor*), 35

G

Gadwall (*Mareca strepera*), 66–68

Gannets. *See* Frigatebirds, Boobies, Gannets, Anhingas, and Cormorants (Suliformes)

Giant Canada Goose (*Branta canadensis maxima*), 52

Glaucous Gull (*Larus hyperboreus*), 311–313

Glaucous-winged Gull (*Larus glaucescens*), 309–311

Glossy Ibis (*Plegadis falcinellus*), 455–456

Golden-cheeked Warbler (*Setophaga chrysoparia*), 708

Golden-crowned Kinglet (*Regulus satrapa*), 574

Golden-crowned Sparrow (*Zonotrichia atricapilla*), 636–638

Golden Eagle (*Aquila chrysaetos*), 469–471

Golden-winged Warbler (*Vermivora chrysoptera*), 531, 675–676

Grace's Warbler (*Setophaga graciae*), 705

Grasshopper Sparrow (*Ammodramus savannarum*), 530, 625

Gray-backed Tern (*Onychoprion lunatus*), 321

Gray Catbird (*Dumetella carolinensis*), 531, 583–584

Gray-cheeked Thrush (*Catharus minimus*), 592–593

Gray-crowned Rosy-Finch (*Leucosticte tephrocotis*), 610

Gray Flycatcher (*Empidonax wrightii*), 547

Gray Hawk (*Buteo plagiatus*), 463, 482

Gray Kingbird (*Tyrannus dominicensis*), 539

Gray Vireo (*Vireo vicinior*), 554

Great Black-Backed Gull (*Larus marinus*), 313–315

Great Blue Heron (*Ardea herodias*), 452–454

Great Cormorant (*Phalacrocorax carbo*), 429

Great Crested Flycatcher (*Myiarchus crinitus*), 533

Great Egret (*Ardea alba*), 433, 449–450

Greater Pewee (*Contopus pertinax*), 542

Greater Scaup (*Aythya marila*), 85

Greater Snow Goose (*Anser caerulescens atlantica*), 37, 38

Greater White-fronted Goose (*Anser albifrons*), 33, 43–44

Greater Yellowlegs (*Tringa melanoleuca*), 224

Great Shearwater (*Ardenna gravis*), 406–407

Great Skua (*Stercorarius skua*), 229–230

Great-tailed Grackle (*Quiscalus mexicanus*), 670

Green Heron (*Butorides virescens*), 433, 448–449

Green-tailed Towhee (*Pipilo chlorurus*), 650

Green-winged Teal (*Anas crecca*), 5, 78–80

Groove-billed Ani (*Crotophaga sulcirostris*), 116

Guadalupe Murrelet (*Synthliboramphus hypoleucus*), 260

Gull-billed Tern (*Gelochelidon nilotica*), 325

Gulls. *See* Shorebirds, Auks, Gulls, and Terns (Charadriiformes)

Gyr Falcon (*Falco rusticolus*), 518, 523–524

H

Hammond's Flycatcher (*Empidonax hammondi*), 546

Harlequin Duck (*Histrionicus histrionicus*), 94–95

Harris's Sparrow (*Zonotrichia querula*), 638

Hawaiian Petrel (*Pterodroma sandwichensis*), 366, 392–393

Hawks, Eagles, Kites, and Osprey (Accipitriformes)

Hawks, Eagles, and Kites (Accipitridae)

American Goshawk (*Accipiter atricapillus*), 463, 474–476

Bald Eagle (*Haliaeetus leucocephalus*), 12, 463, 478–480

Broad-winged Hawk (*Buteo platypterus*), 463, 484–485

Common Black Hawk (*Buteogallus anthracinus*), 481–482

Cooper's Hawk (*Accipiter cooperii*), 463, 473–474

Ferruginous Hawk (*Buteo regalis*), 493–495

Golden Eagle (*Aquila chrysaetos*), 469–471

Gray Hawk (*Buteo plagiatus*), 463, 482

Mississippi Kite (*Ictinia mississippiensis*), 463, 480–481

Northern Harrier (*Circus hudsonius*), 463, 476–477

Red-shouldered Hawk (*Buteo lineatus*), 463, 483–484

Red-tailed Hawk (*Buteo jamaicensis*), 489–491

Rough-legged Hawk (*Buteo lagopus*), 492–493

Sharp-shinned Hawk (*Accipiter striatus*), 463, 472–473

Short-tailed Hawk (*Buteo brachyurus*), 486

Swainson's Hawk (*Buteo swainsoni*), 463, 487–488

Swallow-tailed Kite (*Elanoides forficatus*), 467–468

Zone-tailed Hawk (*Buteo albonotatus*), 463, 488–489

Osprey (Pandionidae)

Osprey (*Pandion haliaetus*), 463, 464–467

overview of, 463

Heermann's Gull (*Larus heermanni*), 296

Henslow's Sparrow (*Centronyx henslowii*), 645

Hepatic Tanager (*Piranga flava*), 712

Hermit Thrush (*Catharus guttatus*), 21, 530, 531, 597–598

Hermit Warbler (*Setophaga occidentalis*), 707

Hérons. *See* Pelicans, Herons, Egrets, Bitterns, Ibises, and Spoonbills (Pelecaniformes)

Herring Gull (*Larus argentatus*), 304–306

Hooded Merganser (*Lophodytes cucullatus*), 104–105

Hooded Oriole (*Icterus cucullatus*), 659

Hooded Warbler (*Setophaga citrina*), 688

Horned Grebe (*Podiceps auritus*), 346, 347

Horned Lark (*Eremophila alpestris*), 564

Horned Puffin (*Fratercula corniculata*), 274

Hudson Bay Common Eider (*Somateria mollissima sedentaria*), 92, 93

Hudsonian Godwit (*Limosa haemastica*), 184

Hudsonian Whimbrel (*Numenius hudsonicus*), 179–181

Hummingbirds. *See* Swifts and Hummingbirds (Apodiformes)

I

Ibises. *See* Pelicans, Herons, Egrets, Bitterns, Ibises, and Spoonbills (Pelecaniformes)

Iceland Gull (*Larus glaucooides*), 307–308

Indigo Bunting (*Passerina cyanea*), 718–719

Interior Canada Goose (*Branta canadensis interior*), 52

Ivory Gull (*Pagophila eburnea*), 285–287

J

Juan Fernandez Petrel (*Pterodroma externa*), 366, 392–393

K

Kentucky Warbler (*Geothlypis formosa*), 686–687
Killdeer (*Charadrius vociferus*), 169
King Eider (*Somateria spectabilis*), 33, 90–91
Kingfishers (Coraciiformes)
 Kingfishers (Alcedinidae)
 Belted Kingfisher (*Megaceryle alcyon*), 510
King Rail (*Rallus elegans*), 142, 143
Kirtland's Warbler (*Setophaga kirtlandii*), 5–6, 690–691
Kites. *See* Hawks, Eagles, Kites, and Osprey (Accipitriformes)
Kittlitz's Murrelet (*Brachyramphus brevirostris*), 258–259

L

Lapland Longspur (*Calcarius lapponicus*), 619–620
Lark Bunting (*Calamospiza melanocorys*), 627
Lark Sparrow (*Chondestes grammacus*), 626–627
Laughing Gull (*Leucophaeus atricilla*), 292–294
Lawrence's Goldfinch (*Spinus lawrencei*), 618
Laysan Albatross (*Phoebastria immutabilis*), 4, 367–371
Lazuli Bunting (*Passerina amoena*), 717–718
Leach's Storm-Petrel (*Hydrobates leucorhous*), 378–380
Least Auklet (*Aethia pusilla*), 267
Least Bittern (*Botaurus exilis*), 433, 439
Least Flycatcher (*Empidonax minimus*), 545–546
Least Sandpiper (*Calidris minutilla*), 200
Least Storm-Petrel (*Hydrobates microsoma*), 366, 384
Least Tern (*Sternula antillarum*), 323–324
LeConte's Sparrow (*Ammospiza leconteii*), 642
Lesser Black-backed Gull (*Larus fuscus*), 308–309
Lesser Canada Goose (*Branta canadensis parvipes*), 52
Lesser Goldfinch (*Spinus psaltria*), 617
Lesser Nighthawk (*Chordeiles acutipennis*), 120–121
Lesser Scaup (*Aythya affinis*), 86–87
Lesser Snow Goose (*Anser caerulescens caerulescens*), 37, 39–40
Lesser Yellowlegs (*Tringa flavipes*), 220–222
Lewis's Woodpecker (*Melanerpes lewis*), 511–512
Lincoln's Sparrow (*Melospiza lincolni*), 648–649
Little Blue Heron (*Egretta caerulea*), 433, 441–442
Little Gull (*Hydrocoloeus minutus*), 290
Loggerhead Strike (*Lanius ludovicianus*), 559–560
Long-billed Curlew (*Numenius americanus*), 181–183
Long-billed Dowitcher (*Limnodromus scolopaceus*), 212–213
Long-eared Owl (*Asio otus*), 496, 505–506
Long-tailed Duck (*Clangula hyernalis*), 33, 99–100
Long-tailed Jaeger (*Stercorarius longicaudus*), 237–239
Loons (Gaviiformes)
 Gaviidae
 Arctic Loon (*Gavia arctica*), 356, 359–360
 Common Loon (*Gavia immer*), 19, 356, 362–364
 Pacific Loon (*Gavia pacifica*), 356, 360–361
 Red-throated Loon (*Gavia stellata*), 356, 357–359
 Yellow-billed Loon (*Gavia adamsii*), 356, 364–365
 overview of, 356

Louisiana Waterthrush (*Parksia motacilla*), 674
Lucifer Hummingbird (*Calothorax lucifer*), 134
Lucy's Warbler (*Leiothlypis luciae*), 682–683

M

MacGillivray's Warbler (*Geothlypis tolmiei*), 685
Magnificent Frigatebird (*Fregata magnificens*), 13, 417, 418–419
Magnolia Warbler (*Setophaga magnolia*), 695
Mallard (*Anas platyrhynchos*), 33, 70–73
Manx Shearwater (*Puffinus puffinus*), 366, 410–411
Marbled Godwit (*Limosa fedoa*), 185–186
Marbled Murrelet (*Brachyramphus marmoratus*), 256–257
Marsh Wren (*Cistothorus palustris*), 582
Masked Booby (*Sula dactylatra*), 419–420
McKay's Bunting (*Plectrophenax hyperboreus*), 623
Merlin (*Falco columbarius*), 518, 521–522
Mexican Whip-poor-will (*Antrostomus arizonae*), 128
Minima Cackling Goose (*Branta hutchinsii minima*), 48
Mississippi Kite (*Ictinia mississippiensis*), 463, 480–481
Mottled Petrel (*Pterodroma inexpectata*), 366, 389
Mountain Bluebird (*Sialia currucoides*), 589
Mountain Plover (*Anarhynchus montanus*), 173–174
Mourning Dove (*Zenaidura macroura*), 113–115
Mourning Warbler (*Geothlypis philadelphia*), 686
Murphy's Petrel (*Pterodroma ultima*), 388–389

N

Nashville Warbler (*Leiothlypis ruficapilla*), 683
Nelson's Sparrow (*Ammospiza nelsoni*), 643
Newell's Shearwater (*Puffinus newelli*), 412–413
New World Vultures (Cathartiformes)
 New World Vultures (Cathartidae)
 Black Vulture (*Coragyps atratus*), 459–460
 Turkey Vulture (*Cathartes aura*), 12, 459, 461–462
 overview of, 459
Nightjars and Allies (Caprimulgiformes)
 Caprimulgidae
 Antillean Nighthawk (*Chordeiles gundlachi*), 123
 Buff-collared Nightjar (*Antrostomus ridgwayi*), 125
 Chuck-will's-widow (*Antrostomus carolinensis*), 124–125
 Common Nighthawk (*Chordeiles minor*), 120, 121–123
 Common Poorwill (*Phalaenoptilus nuttallii*), 124
 Eastern Whip-woor-will (*Antrostomus vociferus*), 124, 126–127
 Lesser Nighthawk (*Chordeiles acutipennis*), 120–121
 Mexican Whip-woor-will (*Antrostomus arizonae*), 128
 overview of, 120
Northern Beardless-Tyrannulet (*Camptostoma imberbe*), 532
Northern Common Eider (*Somateria mollissima borealis*), 92, 93
Northern Flicker (*Colaptes auratus*), 511, 516–517
Northern Fulmar (*Fulmarus glacialis*), 385–387
Northern Gannet (*Morus bassanus*), 417, 423–425
Northern Harrier (*Circus hudsonius*), 463, 476–477
Northern Hawk Owl, 496
Northern House Wren (*Troglodytes aedon*), 580
Northern Mockingbird (*Mimus polyglottos*), 586–587
Northern Parula (*Setophaga americana*), 694
Northern Pintail (*Anas acuta*), 33, 75–77

INDEX

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), 568
 Northern Saw-whet Owl (*Aegolius acadicus*), 508
 Northern Shoveler (*Spatula clypeata*), 64–65
 Northern Shrike (*Lanius borealis*), 560–561
 Northern Waterthrush (*Parkesia noveboracensis*), 2, 674–675
 Northern Wheatear (*Oenanthe oenanthe*), 604–605

O

Olive-sided Flycatcher (*Contopus cooperi*), 540–541
 Olive Warbler (*Peucedramus taeniatus*), 605–606
 Orange-crowned Warbler (*Leiothlypis celata*), 681–682
 Orchard Oriole (*Icterus spurius*), 658
 Osprey (*Pandion haliaetus*), 463, 464–467. *See also* Hawks, Eagles, Kites, and Osprey (Accipitriformes)
 Ovenbird (*Seiurus aurocapilla*), 671–672
 Owls (Strigiformes)
 Barn Owls (Tytonidae)
 American Barn Owl (*Tyto furcata*), 497
 Burrowing Owl (*Athene cunicularia*), 496, 502–503
 Elf Owl (*Micrathene whitneyi*), 501
 Flammulated Owl (*Psiloscops flammeolus*), 498–499
 Long-eared Owl (*Asio otus*), 496, 505–506
 Northern Saw-whet Owl (*Aegolius acadicus*), 508
 Short-eared Owl (*Asio flammeus*), 496, 506–507
 Snowy Owl (*Bubo scandiacus*), 496, 499–501
 Spotted Owl (*Strix occidentalis*), 496, 504
 overview of, 496

P

Pacific Common Eider (*Somateria mollissima v-nigrum*), 92, 93
 Pacific Golden-Plover (*Pluvialis fulva*), 168
 Pacific Greater White-fronted Goose (*Anser albifrons frontalis*), 43–44
 Pacific Loon (*Gavia pacifica*), 356, 360–361
 Pacific Wren (*Troglodytes pacificus*), 581
 Painted Bunting (*Passerina ciris*), 530, 719–721
 Painted Redstart (*Myioborus pictus*), 712
 Palm Warbler (*Setophaga palmarum*), 701
 Parakeet Auklet (*Aethia psittacula*), 266–267
 Parasitic Jaeger (*Stercorarius parasiticus*), 234–236
 Pectoral Sandpiper (*Calidris melanotos*), 204–205
 Pelagic Cormorant (*Urile pelagicus*), 417, 427–428
 Pelicans, Herons, Egrets, Bitterns, Ibises, and Spoonbills (Pelecaniformes)
 Herons, Egrets, and Bitterns (Ardeidae)
 American Bittern (*Botaurus lentiginosus*), 440–441
 Black-crowned Night Heron (*Nycticorax nycticorax*), 6–7, 10, 12, 433, 446–448
 Great Blue Heron (*Ardea herodias*), 452–454
 Great Egret (*Ardea alba*), 433, 449–450
 Green Heron (*Butorides virescens*), 433, 448–449
 Least Bittern (*Botaurus exilis*), 433, 439
 Little Blue Heron (*Egretta caerulea*), 433, 441–442
 Reddish Egret (*Egretta rufescens*), 433, 443–444
 Snowy Egret (*Egretta thula*), 444–445
 Tricolored Heron (*Egretta tricolor*), 433, 442–443
 Western Cattle-Egret (*Ardea ibis*), 451–452
 Yellow-crowned Night Heron (*Nyanassa violacea*), 433, 445–446

Ibises and Spoonbills (Threskiornithidae)
 Glossy Ibis (*Plegadis falcinellus*), 455–456
 Roseate Spoonbill (*Platalea ajaja*), 458
 White-faced Ibis (*Plegadis chihi*), 456–457
 White Ibis (*Eudocimus albus*), 454–455
 overview of, 433
 Pelicans (Pelecanidae)
 American White Pelican (*Pelecanus erythrorhynchos*), 434–436
 Brown Pelican (*Pelecanus occidentalis*), 13, 433, 436–439
 Peregrine Falcon (*Falco peregrinus*), 518, 524–528
 Petrels. *See* Albatrosses, Petrels, and Shearwaters (Procellariiformes)
 Phainopepla (*Phainopepla nitens*), 576
 Philadelphia Vireo (*Vireo philadelphicus*), 556
 Pied-billed Grebe (*Podilymbus podiceps*), 346–347
 Pigeon Guillemot (*Cephus columba*), 255–256
 Pigeons and Doves (Columbiformes)
 Columbidae
 Band-tailed Pigeon (*Patagioenas fasciata*), 110–112
 Mourning Dove (*Zenaidura macroura*), 113–115
 Red-billed Pigeon (*Patagioenas flavirostris*), 110
 White-crowned Pigeon (*Patagioenas leucocephala*), 109–110
 White-winged Dove (*Zenaidura asiatica*), 112–113
 overview of, 109
 Pine Siskin (*Spinus spinus*), 616–617
 Pine Warbler (*Setophaga pinus*), 702
 Pink-footed Shearwater (*Ardenna creatopus*), 366, 408–409
 Piping Plover (*Charadrius melodus*), 11, 172–173
 Plumbeous Vireo (*Vireo plumbeus*), 556
 Podicipedidae (Grebes)
 Clark's Grebe (*Aechmophorus clarkii*), 346, 351
 Eared Grebe (*Podiceps nigricollis*), 348–349
 Horned Grebe (*Podiceps auritus*), 346, 347
 overview of, 346
 Pied-billed Grebe (*Podilymbus podiceps*), 346–347
 Red-necked Grebe (*Podiceps grisegena*), 348
 Western Grebe (*Aechmophorus occidentalis*), 346, 349–350
 Pomarine Jaeger (*Stercorarius pomarinus*), 232–233
 Prairie Falcon (*Falco mexicanus*), 518, 528–529
 Prairie Warbler (*Setophaga discolor*), 704–705
 Prothonotary Warbler (*Protonotaria citrea*), 531, 678–679
 Purple Finch (*Carpodacus purpureus*), 611–613
 Purple Gallinule (*Porphyrio martinica*), 142, 150
 Purple Martin (*Progne subis*), 13, 568–569
 Purple Sandpiper (*Calidris maritima*), 198
 Pygmy Owl, 496

R

Rails, Coots, and Cranes (Gruiformes)
 Gruidae (Cranes)
 Sandhill Crane (*Antigone canadensis*), 142, 153–155
 Whooping Crane (*Grus americana*), 142, 155–156
 overview of, 142
 Rallidae (Rails)
 American Coot (*Fulica americana*), 148–149
 Black Rail (*Laterallus jamaicensis*), 142, 152
 Clapper Rail (*Rallus crepitans*), 142, 144–145
 Common Gallinule (*Gallinula galeata*), 142, 147
 King Rail (*Rallus elegans*), 142, 143
 Purple Gallinule (*Porphyrio martinica*), 150
 Sora (*Porzana carolina*), 146

Virginia Rail (*Rallus limicola*), 145
 Yellow Rail (*Coturnicops noveboracensis*), 142, 151
 Razorbill (*Alca torda*), 250–252
 Red-bellied Woodpecker (*Melanerpes carolinus*), 513
 Red-billed Pigeon (*Patagioenas flaviviridis*), 110
 Red-billed Tropicbird (*Phaethon aethereus*), 354
 Red-breasted Merganser (*Mergus serrator*), 106–107
 Red-breasted Nuthatch (*Sitta canadensis*), 577
 Red-breasted Sapsucker, 511
 Red-cockaded Woodpecker, 511
 Red Crossbill (*Loxia curvirostra*), 615
 Reddish Egret (*Egretta rufescens*), 433, 443–444
 Red-eyed Vireo (*Vireo olivaceus*), 557–558
 Red-faced Warbler (*Cardellina rubrifrons*), 711
 Redhead (*Aythya americana*), 82
 Red-headed Woodpecker (*Melanerpes erythrocephalus*), 511, 512–513
 Red Knot (*Calidris canutus*), 4, 12, 13, 189–191
 Red-legged Kittiwake (*Rissa brevirostris*), 283–284
 Red-naped Sapsucker (*Sphyrapicus nuchalis*), 515
 Red-necked Grebe (*Podiceps grisegena*), 348
 Red-necked Phalarope (*Phalaropus lobatus*), 226–227
 Red Phalarope (*Phalaropus fulicarius*), 227–228
 Redpoll (*Acanthis flammea*), 614–615
 Red-shouldered Hawk (*Buteo lineatus*), 463, 483–484
 Red-tailed Hawk (*Buteo jamaicensis*), 489–491
 Red-tailed Tropicbird (*Phaethon rubricauda*), 354–355
 Red-throated Loon (*Gavia stellata*), 356, 357–359
 Red-throated Pipit (*Anthus cervinus*), 607
 Red-winged Blackbird (*Agelaius phoeniceus*), 661–663
 Rhinoceros Auklet (*Cerorhinca monocerata*), 269–271
 Richardson's Cackling Goose (*Branta hutchinsii hutchinsii*), 48
 Ring-billed Gull (*Larus delawarensis*), 298–300
 Ring-necked Duck (*Aythya collaris*), 83–84
 Rivoli's Hummingbird (*Eugenes fulgens*), 133
 Rock Sandpiper (*Calidris ptilocnemis*), 197
 Rock Wren (*Salpinctes obsoletus*), 579
 Roseate Spoonbill (*Platalea ajaja*), 458
 Roseate Tern (*Sterna dougallii*), 330–331
 Rose-breasted Grosbeak (*Pheucticus ludovicianus*), 4, 5, 715
 Rose-throated Becard (*Pachyrhamphus aglaiae*), 531
 Ross's Goose (*Anser rossii*), 41–42
 Ross's Gull (*Rhodostethia rosea*), 291
 Rough-legged Hawk (*Buteo lagopus*), 492–493
 Royal Tern (*Thalasseus maximus*), 338–340
 Ruby-crowned Kinglet (*Regulus calendula*), 573–574
 Ruby-throated Hummingbird (*Archilochus colubris*), 134–135
 Ruddy Duck (*Oxyura jamaicensis*), 107–108
 Ruddy Turnstone (*Arenaria interpres*), 186–188
 Rufous Hummingbird (*Selasphorus rufus*), 137–138
 Rusty Blackbird (*Euphagus carolinus*), 666–667

S

Sabine's Gull (*Xema sabini*), 287–289
 Sagebrush Sparrow (*Artemisiospiza nevadensis*), 640
 Sage Thrasher (*Oreoscoptes montanus*), 586
 Saltmarsh Sparrow (*Ammodramus caudacuta*), 644
 Sanderling (*Calidris alba*), 12, 194
 Sandhill Crane (*Antigone canadensis*), 142, 153–155
 Sandwich Tern (*Thalasseus sandvicensis*), 341–342
 Sargasso Shearwater (*Puffinus lherminieri*), 366, 414

Savannah Sparrow (*Passerculus sandwichensis*), 646–647
 Say's Phoebe (*Sayornis saya*), 551
 Scarlet Tanager (*Piranga olivacea*), 713–714
 Scissor-tailed Flycatcher (*Tyrannus forficatus*), 540
 Scott's Oriole (*Icterus parisorum*), 661
 Screech Owl, 496
 Scripps's Murrelet (*Synthliboramphus scrippsi*), 260
 Seaside Sparrow (*Ammodramus maritima*), 642–643
 Sedge Wren (*Cistothorus stellaris*), 582
 Semipalmated Plover (*Charadrius semipalmatus*), 171–172
 Semipalmated Sandpiper (*Calidris pusilla*), 206–208
 Sharp-shinned Hawk (*Accipiter striatus*), 463, 472–473
 Shearwaters. *See* Albatrosses, Petrels, and Shearwaters (Procellariiformes)
 Shorebirds, Auks, Gulls, and Terns (Charadriiformes)
 Auks, Murres, and Puffins (Alcidae)
 Ancient Murrelet (*Synthliboramphus antiquus*), 261–263
 Atlantic Puffin (*Fratercula arctica*), 271–274
 Black Guillemot (*Cephus grylle*), 252–254
 Cassin's Auklet (*Ptychoramphus aleuticus*), 263–265
 Common Murre (*Uria aalge*), 241–244
 Craveri's Murrelet (*Synthliboramphus craveri*), 261
 Crested Auklet (*Aethia cristatella*), 268
 Dovekie (*Alle alle*), 240–241
 Guadalupe Murrelet (*Synthliboramphus hypoleucus*), 260
 Horned Puffin (*Fratercula corniculata*), 274
 Kittlitz's Murrelet (*Brachyramphus brevirostris*), 258–259
 Least Auklet (*Aethia pusilla*), 267
 Marbled Murrelet (*Brachyramphus marmoratus*), 256–257
 Parakeet Auklet (*Aethia psittacula*), 266–267
 Pigeon Guillemot (*Cephus columba*), 255–256
 Razorbill (*Alca torda*), 250–252
 Rhinoceros Auklet (*Cerorhinca monocerata*), 269–271
 Scripps's Murrelet (*Synthliboramphus scrippsi*), 260
 Thick-billed Murre (*Uria lomvia*), 245–250
 Tufted Puffin (*Fratercula cirrhata*), 275–276
 Gulls, Terns, and Skimmers (Laridae)
 Aleutian Tern (*Onychoprion aleuticus*), 322–323
 Arctic Tern (*Sterna paradisaea*), 1–2, 4, 335–337
 Black-legged Kittiwake (*Rissa ridactyla*), 277–283
 Black Noddy (*Anous minutus*), 317–318
 Black Skimmer (*Rynchops niger*), 343–345
 Black Tern (*Chlidonias niger*), 328–329
 Bonaparte's Gull (*Chroicocephalus philadelphia*), 289–290
 Bridled Tern (*Onychoprion anaethetus*), 322
 Brown Noddy (*Anous stolidus*), 316
 California Gull (*Larus californicus*), 302–303
 Caspian Tern (*Hydroprogne caspia*), 326–327
 Common Tern (*Sterna hirundo*), 331–335
 Elegant Tern (*Thalasseus elegans*), 342–343
 Forster's Tern (*Sterna forsteri*), 337–338
 Franklin's Gull (*Leucophaeus pipixcan*), 294–295
 Glaucous Gull (*Larus hyperboreus*), 311–313
 Glaucous-winged Gull (*Larus glaucescens*), 309–311
 Gray-backed Tern (*Onychoprion lunatus*), 321
 Great Black-backed Gull (*Larus marinus*), 313–315
 Gull-billed Tern (*Gelochelidon nilotica*), 325
 Heermann's Gull (*Larus heermanni*), 296
 Herring Gull (*Larus argentatus*), 304–306
 Iceland Gull (*Larus glaucoideus*), 307–308
 Ivory Gull (*Pagophila eburnea*), 285–287
 Laughing Gull (*Leucophaeus atricilla*), 292–294
 Least Tern (*Sternula antillarum*), 323–324
 Lesser Black-backed Gull (*Larus fuscus*), 308–309

INDEX

Shorebirds, Auks, Gulls, and Terns (Charadriiformes)

Gulls, Terns, and Skimmers (Laridae) *continued*

- Little Gull (*Hydrocoloeus minutus*), 290
- Red-legged Kittiwake (*Rissa brevirostris*), 283–284
- Ring-billed Gull (*Larus delawarensis*), 298–300
- Roseate Tern (*Sterna dougallii*), 330–331
- Ross's Gull (*Rhodostethia rosea*), 291
- Royal Tern (*Thalasseus maximus*), 338–340
- Sabine's Gull (*Xema sabini*), 287–289
- Sandwich Tern (*Thalasseus sandvicensis*), 341–342
- Short-billed Gull (*Larus brachyrhynchus*), 297
- Sooty Tern (*Onychoprion fuscatus*), 318–320
- Western Gull (*Larus occidentalis*), 300–301

overview of, 157–158

Oystercatchers (Haematopodidae)

- American Oystercatcher (*Haematopus palliatus*), 2, 161–162
- Black Oystercatcher (*Haematopus bachmani*), 162–163

Plovers and Lapwings (Charadriidae)

- American Golden-Plover (*Pluvialis dominica*), 166–167
- Black-bellied Plover (*Pluvialis squatarola*), 12, 164–165
- Common Ringed Plover (*Charadrius hiaticula*), 170
- Killdeer (*Charadrius vociferus*), 169
- Mountain Plover (*Anarhynchus montanus*), 173–174
- Pacific Golden-Plover (*Pluvialis fulva*), 168
- Piping Plover (*Charadrius melodus*), 11, 172–173
- Semipalmated Plover (*Charadrius semipalmatus*), 171–172
- Snowy Plover (*Anarhynchus nivosus*), 175
- Wilson's Plover (*Charadrius wilsonia*), 176

Sandpipers and Allies (Scolopacidae)

- American Woodcock (*Scolopax minor*), 213–215
- Baird's Sandpiper (*Calidris bairdii*), 199
- Bar-tailed Godwit (*Limosa lapponica baueri*), 183
- Black Turnstone (*Arenaria melanocephala*), 188–189
- Bristle-thighed Curlew (*Numenius tahitiensis*), 178–179
- Buff-breasted Sandpiper (*Calidris subruficollis*), 202–203
- Dunlin (*Calidris alpina*), 195–197
- Greater Yellowlegs (*Tringa melanoleuca*), 224
- Hudsonian Godwit (*Limosa haemastica*), 184
- Hudsonian Whimbrel (*Numenius hudsonicus*), 179–181
- Least Sandpiper (*Calidris minutilla*), 200
- Lesser Yellowlegs (*Tringa flavipes*), 220–222
- Long-billed Curlew (*Numenius americanus*), 181–183
- Long-billed Dowitcher (*Limnodromus scolopaceus*), 212–213
- Marbled Godwit (*Limosa fedoa*), 185–186
- Parasitic Jaeger (*Stercorarius parasiticus*), 234–236
- Pectoral Sandpiper (*Calidris melanotos*), 204–205
- Pomarine Jaeger (*Stercorarius pomarinus*), 232–233
- Purple Sandpiper (*Calidris maritima*), 198
- Red Knot (*Calidris canutus*), 4, 12, 13, 189–191
- Red-necked Phalarope (*Phalaropus lobatus*), 226–227
- Red Phalarope (*Phalaropus fulicarius*), 227–228
- Rock Sandpiper (*Calidris ptilocnemis*), 197
- Ruddy Turnstone (*Arenaria interpres*), 186–188
- Sanderling (*Calidris alba*), 12, 194
- Semipalmated Sandpiper (*Calidris pusilla*), 206–208
- Short-billed Dowitcher (*Limnodromus griseus*), 210–211
- Solitary Sandpiper (*Tringa solitaria*), 218
- Spotted Sandpiper (*Actitis macularius*), 217
- Stilt Sandpiper (*Calidris himantopus*), 193
- Surfbird (*Calidris virgata*), 192
- Upland Sandpiper (*Bartramia longicauda*), 177–178
- Wandering Tattler (*Tringa incana*), 219
- Western Sandpiper (*Calidris mauri*), 208–209

White-rumped Sandpiper (*Calidris fuscicollis*), 201

Willet (*Tringa semipalmata*), 222–223

Wilson's Phalarope (*Phalaropus tricolor*), 225

Wilson's Snipe (*Gallinago delicata*), 216

Skuas and Jaegers (Stercorariidae)

- Great Skua (*Stercorarius skua*), 229–230
- Long-tailed Jaeger (*Stercorarius longicaudus*), 237–239
- South Polar Skua (*Stercorarius maccormicki*), 231–232

Stilts and Avocets (Recurvirostridae)

- American Avocet (*Recurvirostra Americana*), 160
- Black-necked Stilt (*Himantopus mexicanus*), 159

Short-billed Dowitcher (*Limnodromus griseus*), 210–211

Short-billed Gull (*Larus brachyrhynchus*), 297

Short-eared Owl (*Asio flammeus*), 496, 506–507

Short-tailed Albatross (*Phoebastria albatrus*), 366, 374–376

Short-tailed Hawk (*Buteo brachyurus*), 486

Short-tailed Shearwater (*Ardenna tenuirostris*), 402–403

Skimmers. *See* Shorebirds, Auks, Gulls, and Terns (Charadriiformes): Gulls, Terns, and Skimmers (Laridae)

Smith's Longspur (*Calcarius pictus*), 621

Snow Bunting (*Plectrophenax nivalis*), 622

Snow Goose (*Anser caerulescens*), 33, 37–40

Snowy Egret (*Egretta thula*), 444–445

Snowy Owl (*Bubo scandiacus*), 496, 499–501

Snowy Plover (*Anarhynchus nivosus*), 175

Solitary Sandpiper (*Tringa solitaria*), 218

Songbirds (Passeriformes)

Crows, Jays, and Magpies (Corvidae)

- American Crow (*Corvus brachyrhynchos*), 562–563
- Blue Jay (*Cyanocitta cristata*), 561–562
- Fish Crow (*Corvus ossifragus*), 563

Finches, Euphonias, and Allies (Fringillidae)

- American Goldfinch (*Spinus tristis*), 618–619
- Black Rosy-Finch (*Leucosticte atrata*), 610
- Brown-capped Rosy-Finch (*Leucosticte australis*), 611
- Cassin's Finch (*Haemorhous cassinii*), 613
- Evening Grosbeak (*Coccothraustes vespertinus*), 608–609
- Gray-crowned Rosy-Finch (*Leucosticte tephrocotis*), 610
- Lawrence's Goldfinch (*Spinus lawrencei*), 618
- Lesser Goldfinch (*Spinus psaltria*), 617
- Pine Siskin (*Spinus spinus*), 616–617
- Purple Finch (*Carpodacus purpureus*), 611–613
- Red Crossbill (*Loxia curvirostra*), 615
- Redpoll (*Acanthis flammea*), 614–615
- White-winged Crossbill (*Loxia leucoptera*), 616

Gnatcatchers (Polioptilidae)

- Blue-gray Gnatcatcher (*Polioptila caerulea*), 578

Kinglets (Regulidae)

- Golden-crowned Kinglet (*Regulus satrapa*), 574
- Ruby-crowned Kinglet (*Regulus calendula*), 573–574

Larks (Alaudidae)

- Horned Lark (*Eremophila alpestris*), 564

Leaf Warblers (Phylloscopidae)

- Arctic Warbler (*Phylloscopus borealis*), 573

Longspurs and Snow Buntings (Calcariidae)

- Chestnut-collared Longspur (*Calcarius ornatus*), 620
- Lapland Longspur (*Calcarius lapponicus*), 619–620
- McKay's Bunting (*Plectrophenax hyperboreus*), 623
- Smith's Longspur (*Calcarius pictus*), 621
- Snow Bunting (*Plectrophenax nivalis*), 622
- Thick-billed Longspur (*Rynchophanes mccownii*), 621

Mockingbirds and Thrashers (Mimidae)

- Bendire's Thrasher (*Toxostoma bendirei*), 585

- Brown Thrasher (*Toxostoma rufum*), 584–585
 Gray Catbird (*Dumetella carolinensis*), 583–584
 Northern Mockingbird (*Mimus polyglottos*), 586–587
 Sage Thrasher (*Oreoscoptes montanus*), 586
 New World Blackbirds and Allies (Icteridae)
 Baltimore Oriole (*Icterus galbula*), 660
 Boat-tailed Grackle (*Quiscalus major*), 670
 Bobolink (*Dolichonyx oryzivorus*), 2, 654–655
 Brewer's Blackbird (*Euphagus cyanocephalus*), 667–668
 Bronzed Cowbird (*Molothrus aeneus*), 664
 Brown-headed Cowbird (*Molothrus ater*), 664–665
 Bullock's Oriole (*Icterus bullockii*), 659
 Chihuahuan Meadowlark (*Sturnella liliana*), 655
 Common Grackle (*Quiscalus quiscula*), 668–669
 Eastern Meadowlark (*Sturnella magna*), 656–657
 Great-tailed Grackle (*Quiscalus mexicanus*), 670
 Hooded Oriole (*Icterus cucullatus*), 659
 Orchard Oriole (*Icterus spurius*), 658
 Red-winged Blackbird (*Agelaius phoeniceus*), 661–663
 Rusty Blackbird (*Euphagus carolinus*), 666–667
 Scott's Oriole (*Icterus parisorum*), 661
 Tricolored Blackbird (*Agelaius tricolor*), 663
 Western Meadowlark (*Sturnella neglecta*), 657–658
 Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), 653–654
 New World Sparrows (Passerellidae)
 American Tree Sparrow (*Spizelloides arborea*), 633
 Bachman's Sparrow (*Peucaea aestivalis*), 624
 Baird's Sparrow (*Centronyx bairdii*), 644–645
 Bell's Sparrow (*Artemisiospiza belli*), 640
 Black-chinned Sparrow (*Spizella atrogularis*), 630
 Black-throated Sparrow (*Amphispiza bilineata*), 626
 Botteri's Sparrow (*Peucaea botterii*), 623
 Brewer's Sparrow (*Spizella breweri*), 631
 Cassin's Sparrow (*Peucaea cassini*), 624
 Chipping Sparrow (*Spizella passerina*), 628–629
 Clay-colored Sparrow (*Spizella pallida*), 629
 Dark-eyed Junco (*Junco hyemalis*), 531, 634–635
 Eastern Towhee (*Pipilo erythrophthalmus*), 651–652
 Field Sparrow (*Spizella pusilla*), 630–631
 Fox Sparrow (*Passerella iliaca*), 21, 632–633
 Golden-crowned Sparrow (*Zonotrichia atricapilla*), 636–638
 Grasshopper Sparrow (*Ammodramus savannarum*), 625
 Green-tailed Towhee (*Pipilo chlorurus*), 650
 Harris's Sparrow (*Zonotrichia querula*), 638
 Henslow's Sparrow (*Centronyx henslowii*), 645
 Lark Bunting (*Calamospiza melanocorys*), 627
 Lark Sparrow (*Chondestes grammacus*), 626–627
 LeConte's Sparrow (*Ammospiza leconteii*), 642
 Lincoln's Sparrow (*Melospiza lincolni*), 648–649
 Nelson's Sparrow (*Ammospiza nelsoni*), 643
 Sagebrush Sparrow (*Artemisiospiza nevadensis*), 640
 Saltmarsh Sparrow (*Ammospiza caudacuta*), 644
 Savannah Sparrow (*Passerculus sandwichensis*), 646–647
 Seaside Sparrow (*Ammospiza maritima*), 642–643
 Song Sparrow (*Melospiza melodia*), 531, 647–648
 Spotted Towhee (*Pipilo maculatus*), 650–651
 Swamp Sparrow (*Melospiza georgiana*), 649–650
 Vesper Sparrow (*Pooecetes gramineus*), 641
 White-crowned Sparrow (*Zonotrichia leucophrys*), 635–636
 White-throated Sparrow (*Zonotrichia albicollis*), 10, 639
 New World Warblers (Parulidae)
 American Redstart (*Setophaga ruticilla*), 2, 530, 531, 689–690
 Bay-breasted Warbler (*Setophaga castanea*), 695–696
 Black-and-white Warbler (*Mniotilta varia*), 677–678
 Blackburnian Warbler (*Setophaga fusca*), 696
 Blackpoll Warbler (*Setophaga striata*), 4, 531, 698–699
 Black-throated Blue Warbler (*Setophaga caerulescens*), 21, 700–701
 Black-throated Gray Warbler (*Setophaga nigrescens*), 706
 Black-throated Green Warbler (*Setophaga virens*), 708
 Blue-winged Warbler (*Vermivora cyanoptera*), 676–677
 Canada Warbler (*Cardellina canadensis*), 530, 531, 709–710
 Cape May Warbler (*Setophaga tigrina*), 692
 Cerulean Warbler (*Setophaga cerulea*), 531, 692–693
 Chestnut-sided Warbler (*Setophaga pennsylvatica*), 698
 Colima Warbler (*Leiothlypis crissalis*), 682
 Common Yellowthroat (*Geothlypis trichas*), 21, 530, 687–688
 Connecticut Warbler (*Oporornis agilis*), 531, 684–685
 Golden-cheeked Warbler (*Setophaga chrysoparia*), 708
 Golden-winged Warbler (*Vermivora chrysoptera*), 531, 675–676
 Grace's Warbler (*Setophaga graciae*), 705
 Hermit Warbler (*Setophaga occidentalis*), 707
 Hooded Warbler (*Setophaga citrina*), 688
 Kentucky Warbler (*Geothlypis formosa*), 686–687
 Kirtland's Warbler (*Setophaga kirtlandii*), 5–6, 690–691
 Louisiana Waterthrush (*Parkesia motacilla*), 674
 Lucy's Warbler (*Leiothlypis luciae*), 682–683
 MacGillivray's Warbler (*Geothlypis tolmiei*), 685
 Magnolia Warbler (*Setophaga magnolia*), 695
 Mourning Warbler (*Geothlypis philadelphia*), 686
 Nashville Warbler (*Leiothlypis ruficapilla*), 683
 Northern Parula (*Setophaga americana*), 694
 Northern Waterthrush (*Parkesia noveboracensis*), 2, 674–675
 Orange-crowned Warbler (*Leiothlypis celata*), 681–682
 Ovenbird (*Seiurus aurocapilla*), 671–672
 Painted Redstart (*Myioborus pictus*), 712
 Palm Warbler (*Setophaga palmarum*), 701
 Pine Warbler (*Setophaga pinus*), 702
 Prairie Warbler (*Setophaga discolor*), 704–705
 Prothonotary Warbler (*Protonotaria citrea*), 531, 678–679
 Red-faced Warbler (*Cardellina rubrifrons*), 711
 Swainson's Warbler (*Lymnethlypis swainsonii*), 680
 Tennessee Warbler (*Leiothlypis peregrina*), 680–681
 Townsend's Warbler (*Setophaga townsendi*), 706–707
 Tropical Parula (*Setophaga pitayumi*), 694
 Virginia's Warbler (*Leiothlypis virginiae*), 684
 Wilson's Warbler (*Cardellina pusilla*), 21, 530, 531, 710–711
 Worm-eating Warbler (*Helmitheros vermivorum*), 673
 Yellow-rumped Warbler (*Setophaga coronata*), 702–703
 Yellow-throated Warbler (*Setophaga dominica*), 21, 703–704
 Yellow Warbler (*Setophaga petechia*), 20, 530, 696–697
 Nuthatches (Sittidae)
 Red-breasted Nuthatch (*Sitta canadensis*), 577
 Old World Flycatchers (Muscicapidae)
 Bluethroat (*Luscinia svecica*), 604
 Northern Wheatear (*Oenanthe oenanthe*), 604–605
 Olive Warbler (Peucedramidae)
 Olive Warbler (*Peucedramus taeniatus*), 605–606
 overview of, 530–531
 Shrikes (Laniidae)
 Loggerhead Shrike (*Lanius ludovicianus*), 559–560
 Northern Shrike (*Lanius borealis*), 560–561
 Silky-Flycatchers (Ptilionotidae)
 Phainopepla (*Phainopepla nitens*), 576
 Swallows (Hirundinidae)
 Bank Swallow (*Riparia riparia*), 565
 Barn Swallow (*Hirundo rustica*), 22, 531, 570–571

INDEX

Songbirds (Passeriformes)

Swallows (Hirundinidae) *continued*

- Cave Swallow (*Petrochelidon fulva*), 572
- Cliff Swallow (*Petrochelidon pyrrhonota*), 571–572
- Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), 568
- Purple Martin (*Progne subis*), 13, 568–569
- Tree Swallow (*Tachycineta icolor*), 566–567
- Violet-green Swallow (*Tachycineta thalassina*), 567

Tanagers, Grosbeaks, and Buntings (Cardinalidae)

- Black-headed Grosbeak (*Pheucticus melanocephalus*), 716
- Blue Grosbeak (*Passerina caerulea*), 717
- Dickcissel (*Spiza americana*), 722
- Hepatic Tanager (*Piranga flava*), 712
- Indigo Bunting (*Passerina cyanea*), 718–719
- Lazuli Bunting (*Passerina amoena*), 717–718
- Painted Bunting (*Passerina ciris*), 530, 719–721
- Rose-breasted Grosbeak (*Pheucticus ludovicianus*), 4, 5, 715
- Scarlet Tanager (*Piranga olivacea*), 713–714
- Summer Tanager (*Piranga rubra*), 713
- Varied Bunting (*Passerina versicolor*), 719
- Western Tanager (*Piranga ludoviciana*), 714

Thrushes (Turdidae)

- American Robin (*Turdus migratorius*), 4, 10, 11, 600–602
- Bicknell's Thrush (*Catharus bicknelli*), 593–594
- Eastern Bluebird (*Sialia sialis*), 4, 587–588
- Gray-cheeked Thrush (*Catharus minimus*), 592–593
- Hermit Thrush (*Catharus guttatus*), 21, 530, 531, 597–598
- Mountain Bluebird (*Sialia currucoides*), 589
- Swainson's Thrush (*Catharus ustulatus*), 14, 16, 21, 530, 595–596
- Townsend's Solitaire (*Myadestes townsendi*), 590
- Varied Thrush (*Ixoreus naevius*), 603
- Veery (*Catharus fuscescens*), 2, 530, 590–592
- Western Bluebird (*Sialia mexicana*), 588
- Wood Thrush (*Hylocichla mustelina*), 2, 21, 599–600

Tityras and Allies (Tityridae)

- Acadian Flycatcher (*Empidonax virescens*), 544
- Alder Flycatcher (*Empidonax alnorum*), 544
- Ash-throated Flycatcher (*Myiarchus cinerascens*), 533
- Black Phoebe (*Sayornis nigricans*), 549
- Brown-crested Flycatcher (*Myiarchus tyrannulus*), 534
- Buff-breasted Flycatcher (*Empidonax fulvifrons*), 549
- Cassin's Kingbird (*Tyrannus vociferans*), 536
- Couch's Kingbird (*Tyrannus couchii*), 535
- Dusky Flycatcher (*Empidonax oberholseri*), 547
- Dusky-capped Flycatcher (*Myiarchus tuberculifer*), 532
- Eastern Kingbird (*Tyrannus tyrannus*), 538–539
- Eastern Phoebe (*Sayornis phoebe*), 550
- Eastern Wood-Pewee (*Contopus virens*), 543
- Gray Flycatcher (*Empidonax wrightii*), 547
- Gray Kingbird (*Tyrannus dominicensis*), 539
- Great Crested Flycatcher (*Myiarchus crinitus*), 533
- Greater Pewee (*Contopus pertinax*), 542
- Hammond's Flycatcher (*Empidonax hammondii*), 546
- Least Flycatcher (*Empidonax minimus*), 545–546
- Northern Beardless-Tyrannulet (*Camptostoma imberbe*), 532
- Olive-sided Flycatcher (*Contopus cooperi*), 540–541
- Rose-throated Becard (*Pachyrhamphus aglaiae*), 531
- Say's Phoebe (*Sayornis saya*), 551
- Scissor-tailed Flycatcher (*Tyrannus forficatus*), 540
- Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*), 534
- Thick-billed Kingbird (*Tyrannus crassirostris*), 536
- Tropical Kingbird (*Tyrannus melancholicus*), 535
- Vermilion Flycatcher (*Pyrocephalus rubinus*), 551–552

- Western Flycatcher (*Empidonax difficilis*), 548
- Western Kingbird (*Tyrannus verticalis*), 537
- Western Wood-Pewee (*Contopus sordidulus*), 542
- Willow Flycatcher (*Empidonax traillii*), 20, 530, 531, 545
- Yellow-bellied Flycatcher (*Empidonax flaviventris*), 543

Treecreepers (Certhiidae)

- Brown Creeper (*Certhia americana*), 577–578

Vireos (Vireonidae)

- Bell's Vireo (*Vireo bellii*), 553
- Black-capped Vireo (*Vireo atricapilla*), 552
- Black-whiskered Vireo (*Vireo altiloquus*), 559
- Blue-headed Vireo (*Vireo solitarius*), 555
- Cassin's Vireo (*Vireo cassinii*), 555
- Gray Vireo (*Vireo vicinior*), 554
- Philadelphia Vireo (*Vireo philadelphicus*), 556
- Plumbeous Vireo (*Vireo plumbeus*), 556
- Red-eyed Vireo (*Vireo olivaceus*), 557–558
- Warbling Vireo (*Vireo gilvus*), 557
- White-eyed Vireo (*Vireo griseus*), 552–553
- Yellow-throated Vireo (*Vireo flavifrons*), 554

Wagtails and Pipits (Motacillidae)

- American Pipit (*Anthus rubescens*), 607
- Eastern Yellow Wagtail (*Motacilla tschutschensis*), 606
- Red-throated Pipit (*Anthus cervinus*), 607
- Sprague's Pipit (*Anthus spragueii*), 608
- White Wagtail (*Motacilla alba*), 606

Waxwings (Bombycillidae)

- Bohemian Waxwing (*Bombycilla garrulus*), 574–575
- Cedar Waxwing (*Bombycilla cedrorum*), 5, 575–576

Wrens (Troglodytidae)

- Bewick's Wren (*Thryomanes bewickii*), 579
- Marsh Wren (*Cistothorus palustris*), 582
- Northern House Wren (*Troglodytes aedon*), 580
- Pacific Wren (*Troglodytes pacificus*), 581
- Rock Wren (*Salpinctes obsoletus*), 579
- Sedge Wren (*Cistothorus stellaris*), 582
- Winter Wren (*Troglodytes hiernalis*), 581

Yellow-breasted Chat (Icteriidae)

- Yellow-breasted Chat (*Icteria virens*), 530, 652–653

Song Sparrow (*Melospiza melodia*), 531, 647–648

Sooty Shearwater (*Ardenna grisea*), 404–406

Sooty Tern (*Onychoprion fuscatus*), 318–320

Sora (*Porzana carolina*), 146

South Polar Skua (*Stercorarius maccormicki*), 231–232

Spectacled Eider (*Somateria fischeri*), 33, 89–90

Spoonbills. *See* Pelicans, Herons, Egrets, Bitterns, Ibises, and Spoonbills (Pelecaniformes)

Spotted Owl (*Strix occidentalis*), 496, 504

Spotted Sandpiper (*Actitis macularius*), 217

Spotted Towhee (*Pipilo maculatus*), 650–651

Sprague's Pipit (*Anthus spragueii*), 608

Steller's Eider (*Polysticta stelleri*), 33, 88–89

Stilts and Avocets (Recurvirostridae)

- American Avocet (*Recurvirostra americana*), 160

- Black-necked Stilt (*Himantopus mexicanus*), 159

Stilt Sandpiper (*Calidris himantopus*), 193

Storks (Ciconiiformes)

- overview of, 415

Storks (Ciconiidae)

- Wood Stork (*Mycteria Americana*), 415–416

Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*), 534

Summer Tanager (*Piranga rubra*), 713

Surfbird (*Calidris virgata*), 192

Surf Scoter (*Melanitta perspicillata*), 95–96
 Swainson's Hawk (*Buteo swainsoni*), 463, 487–488
 Swainson's Thrush (*Catharus ustulatus*), 14, 16, 21, 530, 595–596
 Swainson's Warbler (*Lymnophylis swainsonii*), 680
 Swallow-tailed Kite (*Elanoides forficatus*), 467–468
 Swamp Sparrow (*Melospiza georgiana*), 649–650
 Swifts and Hummingbirds (Apodiformes)

Apodidae (Swifts)

Black Swift (*Cypseloides niger*), 129, 130
 Chimney Swift (*Chaetura pelagica*), 129, 131
 Vaux's Swift (*Chaetura vauxi*), 132
 White-throated Swift (*Aeronautes saxatalis*), 132

overview of, 129

Trochilidae (Hummingbirds)

Allen's Hummingbird (*Selasphorus sasin*), 129, 138–139
 Anna's Hummingbird (*Calypte anna*), 136
 Black-chinned Hummingbird (*Archilochus alexandri*), 135
 Blue-throated Mountain-gem (*Lampornis clemenciae*), 133
 Broad-billed Hummingbird (*Lampornis clemenciae*), 140
 Broad-tailed Hummingbird (*Selasphorus platycircus*), 139
 Buff-bellied Hummingbird (*Amazilia yucatanensis*), 141
 Calliope Hummingbird (*Selasphorus calliope*), 137
 Costa's Hummingbird (*Calypte costae*), 136
 Lucifer Hummingbird (*Calothorax lucifer*), 134
 Rivoli's Hummingbird (*Eugenes fulgens*), 133
 Ruby-throated Hummingbird (*Archilochus colubris*), 134–135
 Rufous Hummingbird (*Selasphorus rufus*), 137–138
 Violet-crowned Hummingbird (*Leucolia violiceps*), 140

T

Taverner's Cackling Goose (*Branta hutchinsii taverneri*), 48
 Tennessee Warbler (*Leiothlypis peregrina*), 680–681
 Terns. *See* Shorebirds, Auks, Gulls, and Terns (Charadriiformes); Shorebirds, Auks, Gulls, and Terns (Charadriiformes): Gulls, Terns, and Skimmers (Laridae)
 Thick-billed Longspur (*Rynchophanes mccownii*), 621
 Thick-billed Murre (*Uria lomvia*), 245–250
 Townsend's Shearwater (*Puffinus auricularis*), 411–412, 413
 Townsend's Solitaire (*Myadestes townsendi*), 590
 Townsend's Storm-Petrel (*Hydrobates socorroensis*), 381
 Townsend's Warbler (*Setophaga townsendi*), 706–707
 Tree Swallow (*Tachycineta icolor*), 566–567
 Tricolored Blackbird (*Agelaius tricolor*), 530, 663
 Tricolored Heron (*Egretta tricolor*), 433, 442–443
 Trindade Petrel (*Pterodroma arminjoniana*), 387–388
 Tristram's Storm-Petrel (*Hydrobates tristrami*), 366, 384
 Trogons (Trogoniformes)
 Trogons (Trogonidae)
 Elegant Trogon (*Trogon elegans*), 509
 Tropical Kingbird (*Tyrannus melancholicus*), 535
 Tropical Parula (*Setophaga pitiayumi*), 694
 Tropicbirds (Phaethontiformes)
 overview of, 352
 Tropicbirds (Phaethontidae)
 Red-billed Tropicbird (*Phaethon aethereus*), 354
 Red-tailed Tropicbird (*Phaethon rubricauda*), 354–355
 White-tailed Tropicbird (*Phaethon lepturus*), 352–353
 Trumpeter Swan (*Cygnus buccinator*), 12, 53–54
 Tufted Puffin (*Fratercula cirrhata*), 275–276
 Tule Greater White-fronted Goose (*Anser albifrons gambelli*), 43–44

Tundra Swan (*Cygnus columbianus*), 12, 13, 54–55
 Turkey Vulture (*Cathartes aura*), 12, 459, 461–462

U

Upland Sandpiper (*Bartramia longicauda*), 177–178

V

Vancouver Canada Goose (*Branta canadensis fulva*), 51
 Varied Bunting (*Passerina versicolor*), 719
 Varied Thrush (*Ixoreus naevius*), 603
 Vaux's Swift (*Chaetura vauxi*), 132
 Veery (*Catharus fuscescens*), 2, 530, 590–592
 Velvet Scoter, 97
 Vermilion Flycatcher (*Pyrocephalus rubinus*), 551–552
 Vesper Sparrow (*Poocetes gramineus*), 641
 Violet-crowned Hummingbird (*Leucolia violiceps*), 140
 Violet-green Swallow (*Tachycineta thalassina*), 567
 Virginia Rail (*Rallus limicola*), 145
 Virginia's Warbler (*Leiothlypis virginiae*), 684

W

Wandering Tattler (*Tringa incana*), 219
 Warbling Vireo (*Vireo gilvus*), 557
 Wedge-tailed Shearwater (*Ardenna pacifica*), 400–401
 Western Bluebird (*Sialia mexicana*), 588
 Western Canada Goose (*Branta canadensis moffitti*), 51
 Western Cattle-Egret (*Ardea ibis*), 451–452
 Western Flycatcher (*Empidonax difficilis*), 548
 Western Grebe (*Aechmophorus occidentalis*), 346, 349–350
 Western Gull (*Larus occidentalis*), 300–301
 Western High Arctic Brant, 45, 46–47
 Western Kingbird (*Tyrannus verticalis*), 537
 Western Meadowlark (*Sturnella neglecta*), 657–658
 Western Sandpiper (*Calidris mauri*), 208–209
 Western Tanager (*Piranga ludoviciana*), 714
 Western Wood-Pewee (*Contopus sordidulus*), 542
 White-crowned Pigeon (*Patagioenas leucocephala*), 109–110
 White-crowned Sparrow (*Zonotrichia leucophrys*), 635–636
 White-eyed Vireo (*Vireo griseus*), 552–553
 White-faced Ibis (*Plegadis chihi*), 456–457
 White-faced Storm-Petrel (*Pelagodroma marina*), 366, 377
 White Ibis (*Eudocimus albus*), 454–455
 White-rumped Sandpiper (*Calidris fuscicollis*), 201
 White-tailed Tropicbird (*Phaethon lepturus*), 352–353
 White-throated Sparrow (*Zonotrichia albicollis*), 10, 639
 White-throated Swift (*Aeronautes saxatalis*), 132
 White Wagtail (*Motacilla alba*), 606
 White-winged Crossbill (*Loxia leucoptera*), 616
 White-winged Dove (*Zenaida asiatica*), 112–113
 White-winged Scoter (*Melanitta deglandi*), 96–97
 Whooping Crane (*Grus americana*), 142, 155–156
 Willet (*Tringa semipalmata*), 222–223
 Williamson's Sapsucker (*Sphyrapicus thyroideus*), 511, 514
 Willow Flycatcher (*Empidonax traillii*), 20, 530, 531, 545

INDEX

Wilson's Phalarope (*Phalaropus tricolor*), 225
 Wilson's Plover (*Charadrius wilsonia*), 176
 Wilson's Snipe (*Gallinago delicata*), 216
 Wilson's Storm-Petrel (*Oceanites oceanicus*), 366, 376
 Wilson's Warbler (*Cardellina pusilla*), 21, 530, 531, 710–711
 Winter Wren (*Troglodytes hiernalis*), 581
 Wood Duck (*Aix sponsa*), 56–58
 Woodpeckers (Piciformes)
 overview of, 511
 Woodpeckers (Picidae)
 Lewis's Woodpecker (*Melanerpes lewis*), 511–512
 Northern Flicker (*Colaptes auratus*), 511, 516–517
 Red-bellied Woodpecker (*Melanerpes carolinus*), 513
 Red-breasted Sapsucker (*Sphyrapicus ruber*), 516
 Red-headed Woodpecker (*Melanerpes erythrocephalus*), 511, 512–513
 Red-naped Sapsucker (*Sphyrapicus nuchalis*), 515
 Williamson's Sapsucker (*Sphyrapicus thyroideus*), 511, 514
 Yellow-bellied Sapsucker (*Sphyrapicus varius*), 514–515
 Wood Stork (*Mycteria americana*), 415–416
 Wood Thrush (*Hylocichla mustelina*), 2, 21, 599–600
 Worm-eating Warbler (*Helmitheros vermivorum*), 673

Y

Yellow-bellied Flycatcher (*Empidonax flaviventris*), 543
 Yellow-bellied Sapsucker (*Sphyrapicus varius*), 514–515
 Yellow-billed Cuckoo (*Coccyzus americanus*), 117–118
 Yellow-billed Loon (*Gavia adamsii*), 356, 364–365
 Yellow-breasted Chat (*Icteria virens*), 530, 652–653
 Yellow-crowned Night Heron (*Nyctanassa violacea*), 433, 445–446
 Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), 653–654
 Yellow Rail (*Coturnicops noveboracensis*), 142, 151
 Yellow-rumped Warbler (*Setophaga coronata*), 702–703
 Yellow-throated Vireo (*Vireo flavifrons*), 554
 Yellow-throated Warbler (*Setophaga dominica*), 21, 703–704
 Yellow Warbler (*Setophaga petechia*), 20, 530, 696–697

Z

Zino's Petrel, 395
 Zone-tailed Hawk (*Buteo albonotatus*), 463, 488–489

