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Feeding Groups, Breeding, and Migratory Information For Common Birds Observed In and Around Cotton Fields

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Following is a discussion of the diet composition and feeding groups of the birds that were most commonly seen during the two years of bird surveys conducted across the cotton belt as well as field studies conducted in Arizona and Louisiana. The five most abundant species from Arizona, Texas, and the Southeast were included in the list along with additional species for which sufficient information on dietary composition was readily available, principally through "The Birds of North America: Life Histories for the 21st Century" series. All species seen or known to exist across the cotton belt are not included, but representative species from each feeding group or guild are represented, except for strict scavengers. Strict scavengers are not thought to be at high risk because few were seen in the vicinity of cotton fields, and residues measured in small mammals do not indicated high risk of secondary poisoning.

The following groupings are based on diet composition with an emphasis on risk categorization for exposure to a liquid pesticide sprayed on cotton. The feeding categories purported to be of highest risk are seeds and terrestrial insects (see discussion in American Cyanamid Risk Assessment). Therefore, the proportions of seeds and terrestrial insects within the diet were most important for delineating the feeding groups. The list follows a general trend from highest risk of dietary exposure, to lowest risk of dietary exposure, i.e. birds in Group A are thought to be at a greater risk to exposure than birds in, for example, Group H.

Group A. These species eat a combination of plant and insect food items. When they select insects as food, they are primarily gleeners or they select insects off plants and may select exceedingly small insects or eggs. All have relatively narrow bills allowing them to remove insects from crevices in bark or other locations. None of them consume more than 50% plant matter and what plant matter they consume is primarily if not solely seeds, not vegetation or buds.

Group B. These species are almost if not entirely insectivorous, but do not focus on flying insects.

Group C. This group species consumes a range of food items, generally more insect matter than plant matter. They all possess "seed-eating" bills.

Group D. These species consume almost entirely seeds.

Group E. These species focus heavily on seeds, but consume notable quantities of insects and other invertebrates.

Group F. These species all eat primarily flying insects. Little if any plant matter is consumed.

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Group F.1. These species also eat primarily flying insects, but they also may collect insects from the ground. Measurable, but small amounts plant matter are consumed.

Group G. These species are generalist, omnivores. They consume somewhat more plant matter than insect matter with all items being of a moderate size range (e.g. do not eat insect eggs and do not consume plant matter as large as acorns).

Group H. These species are omnivores, as are Group G, but will select larger plant seeds, such as acorns.

Group J. These omnivorous species consume more animal matter than plant matter.

Group K. These species consume considerable quantities of insects, particularly during the breeding season and focus on fruit as the plant matter portion of their diet, primarily during the late summer, fall and winter.

Group L. These species focus on legumes, buds and at times leafy vegetation as well as insects. Insects comprise less than 50% of their diet.

Group M. These species feed mostly in aquatic environments, consuming vegetation and aquatic animals, primarily aquatic invertebrates. Aquatic vegetation comprises more than 50% of their diet.

Group N. These species feed mostly in aquatic environments, consuming primarily fish and other aquatic animals.

Group O. These species feed mostly in aquatic environments, consuming vegetation and aquatic animals, primarily aquatic invertebrates. Aquatic invertebrates comprise more than 50% of their diet.

Group P. These are predatory species focussing on terrestrial vertebrates, primarily small mammals.

Group Q. These are predatory species focussing on terrestrial vertebrates, primarily small birds.

Group R. These species focus on floral nectar along with small insects and spiders.

To better assess risk to birds following an application of a liquid pesticide such as PIRATE or ALERT to cotton, representative species from feeding groups A, B, C, D, and G. were selected. Feeding groups A through D were selected because these birds focus on either seeds and/or non-flying insects throughout the entire time when PIRATE or ALERT may be sprayed. Group G was selected because these birds are more omnivorous with a variable diet approaching a more even mixture of plant and animal matter.

Selection criteria for the representative species were: 1) they are within one of the high exposure feeding groups, 2) their feeding habits indicate they are likely to feed in cotton, 3) they are resident to or breed in the cotton belt, and 4) their breeding habitat indicates they may breed within or near agriculture, including cotton. When possible, birds thought to be at risk of exposure from across the cotton belt were selected rather than birds restricted to either southern (Texas and eastward) or western (Arizona and California) cotton regions.

Representative of Group A: Carolina Wren

Representative of Group B: White-eyed Vireo

Representative of Group C: Northern Cardinal, Blue Grosbeak

Representative of Group D: Mourning Dove

Representative of Group G: Red-winged Blackbird

Information used to make these selection is found in the following tables

Groupings according diet composition of the most abundant species from 1993 and 1995 avian surveys as well as those additional species for which information was readily available. The groups are those feeding groups described above. Body weight values were gotten from Dunning (1993). The references provided in this table also apply to information presented in subsequent tables.

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
A	Southern	Carolina Chickadee	Passeriformes	Paridae	*Parus*	10.2	Breeding season - caterpillars, nonbreeding season - often insect eggs and pupae overall 50% plant, 50% animal (used black-capped chickadee as surrogate for proportion of plant or animal); 72% animal, 28% plant.	2,53,83
A	Southern	Tufted Titmouse	Passeriformes	Paridae	*Parus*	21.6	Feeds on an assortment of insects and seeds with 66% animal and 34% vegetable. Animal food includes caterpillars, cotton boll weevil, other beetles, ants, wasps, bees, stink bugs, treehoppers, scales, flies, insect eggs, spiders, and snails	29
A	Southern	White-breasted Nuthatch	Passeriformes	Sittidae	*Sitta*	21.1	Feeds on a variety of insects and plant matter. Seeds in the diet: winter-68%, spring-48%, summer-none, fall-29%. Insects include weevils, wood borers, leaf beetles, tree hoppers, psyllids, scale insects, ants, insect eggs, and caterpillars.	66
A	Southern	Carolina Wren	Passeriformes	Troglodytidae	*Thryothorus*	18.7	94% insect (ants, Hymenoptera, flies millipedes), 6% plant throughout entire year	30,53
B	Southern	American Redstart	Passeriformes	Emberizidae	*Setophaga*	8.3	In breeding season, feeds mostly on insects, including Homoptera, Diptera, Hymenoptera, Coleoptera, and Lepidoptera. Some small berries and fruits late in the summer. Mostly insects in winter.	82

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
B	Southern	Hooded Warbler	Passeriformes	Emberizidae	*Wilsonia*	10.4	Winter: insects and other small arthropods. Breeding season: small spiders and insects including caterpillars, moths, grasshoppers, beetles and flies.	22
B	Southern	Louisiana Waterthrush	Passeriformes	Emberizidae	*Seiurus*	19.3	Aquatic insects and invertebrates; also small to medium flying insects.	71
B	Southern	Northern Parula	Passeriformes	Emberizidae	*Parula*	8.6	During breeding season, mostly insects, such as caterpillars, beetles, moths, ants, wasps bees flies, locusts, scale insects, plant lice, lacewing flies, and mayflies, and spiders, rarely bud scales. In winter, mostly insects and spiders, less often (in suboptimal habitats) berries, seeds and nectar.	57
B	Southern	White-eyed Vireo	Passeriformes	Vireonidae	*Vireo*	11.4	Insects, especially lepidopteran larvae. Some fruit taken all year, but more during nonbreeding season. 90% of diet is animal matter, of which 96% is insects.	35
B	Southern	Yellow-throated Vireo	Passeriformes	Vireonidae	*Vireo*	18.0	Consumes wide variety of arthropods. May take fruits and seeds in late summer, fall, and winter. 98.3% animal matter during breeding season; with Lepidoptera, Hemiptera, Coleoptera, Diptera, and Hymenoptera being most important.	73

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
C	Southern	Eastern Towhee (Formerly Rufous-sided Towhee)	Passeriformes	Emberizidae	*Pipilo*	40.5	Omnivore consumes seeds, fruits, and invertebrates including Coleoptera, Lepidoptera, Orthoptera, Hymenoptera, Hemiptera, spiders, millipedes, centipedes, and snails. Also eats soft foliage buds, young furled grass stems, soft flower buds of Virginia spring beauty.	27
C	Southern	Northern Cardinal	Passeriformes	Emberizidae	*Cardinalis*	44.6	Insects (caterpillars, grasshoppers true bugs, beetles) and seeds or fruit (bristlegrass, blackberry, grape corn); 71% animal, 29%veg.	1
C	Southern	Swamp Sparrow	Passeriformes	Emberizidae	*Melospiza*	17.0	Mostly arthropods during breeding season: such as Odonata, Coleoptera, Hymenoptera, Homoptera; also seeds and fleshy fruits when available. During winter, seeds and fruits, terrestrial and aquatic invertebrates when available. Diet 88% insects during breeding and 55% in winter.	59
C	Southern	Pileated Woodpecker	Piciformes	Picidae	*Dryocopus*	287	Eats insects, primarily carpenter ants and woodboring beetle larvae, also wild fruits and nuts. May consume up to 27% vegetable matter at some times of the year.	7
C	Southern	Red-Bellied Woodpecker	Piciformes	Picidae	*Melanerpes*	61.7	26% plant, 74% animal. Animal: ants>beetles>larvae>caterpillars>etc. Plant: corn, berries, nuts	2
D	Southern	House Finch	Passeriformes	Fringillidae	*Carpodacus*	21.4	97% vegetable matter including buds, seeds and fruits. Feeds young exclusively vegetable matter.	33

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
F	Southern	Chimney Swift	Apodiformes	Apodidae	*Chaetura*	23.6	All insects, no plant food. Eats beetles, flies, ants, termites, bugs caught in the air. Also spiders	53, 85
F	Southern	Eastern Wood-Pewee	Passeriformes	Tyrannidae	*Contopus*	14.1	Primarily small flying insects. Occasionally gleans insects from foliage or ground. Insects include Diptera, Homoptera, Lepidoptera, Hymenoptera, Coleoptera, Orthoptera, Plecoptera, and Ephemeroptera	54
F.1	Southern	Eastern Kingbird	Passeriformes	Tyrannidae	*Tyrannus*	43.6	Primarily insects with diet supplemented with fruit late in the summer and during non-breeding season. Diet is 85.5% insects during breeding season, including Hymenoptera, Coleoptera, Orthoptera, Hemiptera, and Diptera.	61
F.1	Southern	Eastern Phoebe	Passeriformes	Tyrannidae	*Sayornis*	19.8	Primarily flying insects, small fruits in fall winter and spring.	91
F.1	Southern	Great crested Flycatcher	Passeriformes	Tyrannidae	*Myiarchus*	33.5	Insects and other invertebrates supplemented with small berries and fruits. Insects include moths and butterflies, beetles, grasshoppers and crickets, bugs, bees and wasps, and small flies.	47
F.1	Southern	Scissor-tailed Flycatcher	Passeriformes	Tyrannidae	*Tyrannus*	43.2	No published information.	
H	Southern	Blue Jay	Passeriformes	Corvidae	*Cyanocitta*	128	Large insects (caterpillars, grasshoppers and beetles), acorns, pine nuts; more plant than animals – 3X more.	53,85
K	Southern	Brown Thrasher	Passeriformes	Mimidae	*Toxostoma*	68.8	Insects (beetles, grasshoppers, crickets, ants, caterpillars, and spiders), fruits (blackberry, elderberry, holly, hackberry) and acorns; 60% plant, 40% animal.	53

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
K	Southern	Wood Thrush	Passeriformes	Muscicapidae	*Hylocichla*	51.2	Feeds mostly on soil invertebrates; uses fruit greater in last summer, fall and late winter. Primary invertebrates include larval and adult insects, millipedes, and isopods.	76
L	Southern	Indigo Bunting	Passeriformes	Emberizidae	*Passerina*	14.6	Winter – ragweed, bristlegrass, wheat oats, blackberry, elderberry and buds, summer – caterpillars, beetles, grasshoppers, small spiders and berries	53,63
L	Southern	Painted Bunting	Passeriformes	Emberizidae	*Passerina*	15.6	86% plant (70% is bristlegrass), 14% animal (grasshoppers, beetles, caterpillars, true bugs) – only summer values reported; 21% animal, 79% vegetation.	2,53
L	Southern	Northern Bobwhite	Galliformes	Phasianidae	*Colinus*	178	Seeds, especially legumes and cultivated grains (lespedeza, beggarweed oak, partridgepea, cowpea, ragweed), insects vary with season (ground beetles, leaf beetles, weevils, grasshoppers, crickets, bugs caterpillars). Young almost exclusively insectivorous.	53
L	Southern	Wild Turkey	Galliformes	Phasianidae	*Melagris*	5810	Primarily vegetable matter. Acorns a very important food item along with other tree mast or fruit. In summer, seeds of grasses and sedges predominate, also small amounts of ground beetles, other insects and salamanders.	19
N	Southern	Belted Kingfisher	Coraciiformes	Alcedinedae	*Ceryle*	148	Diet mostly fish with some mollusks, crustaceans, insects, amphibians, reptiles, young birds, small mammals and even berries.	31

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
N	Southern	Little Blue Heron	Ciconiiformes	Ardeidae	*Egretta*	340	Opportunistic; takes a variety of small fish, small amphibians, and invertebrates, particularly crustaceans.	74
N	Southern	Yellow-crowned Night Heron	Ciconiiformes	Ardeidae	*Nyctanassa*	682	Fresh and saltwater crustaceans.	90
O	Southern	White Ibis	Ciconiiformes	Threskiornithidae	*Eudocimus*	900	Mainly aquatic crustaceans and insects, also fish and will consume almost whatever is available.	44
P	Southern	Broad-winged Hawk	Falconiformes	Accipitridae	*Buteo*	455	Generalized predator taking amphibians, insects, mammals, and juvenile birds with mammals and amphibians most common.	25
P	Southern	Red-shouldered Hawk	Falconiformes	Accipitridae	*Buteo*	559	Eats small mammals and birds, reptiles, and amphibians. Crayfish are important locally. Primarily small mammals.	12
P	Southern	Eastern Screech Owl	Strigiformes	Strigidae	*Otus*	180	Mainly invertebrates, primarily insects, crayfish and earthworms, all classes of vertebrates, especially songbirds and rodents.	24
R	Southern	Ruby-throated Hummingbird	Apodiformes	Trochilidae	*Archilochus*	3.2	Floral nectar and small insects, also tree sap when nectar is not available.	70
B	Beltwide	Cattle Egret	Ciconiiformes	Ardeidae	*Bubulcus*	338	Diet varies according to foraging habitat, feeding opportunity, and prey availability. Mostly grasshoppers, crickets, spiders, flies, frogs and noctuid moths.	84
B	Beltwide	Bell's Vireo	Passeriformes	Vireonidae	*Vireo*	8.5	Eats primarily caterpillars, stinkbugs, bees, wasps, and weevils. 99.3% insects and spider, 0.7% fruit.	3

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
C	Beltwide	Horned Lark	Passeriformes	Alaudidae	*Eromophila*	31.3	Winter – mostly seeds, breeding - adults eat seeds (bristlegrass, ragweed, pigweed, knotweed, goosefoot, redmaids, oats) but feed young insects, spring and fall - more insects possibly to compensate for breeding and molt energetic demands (beetles, caterpillars, and grasshoppers).	1,53
C	Beltwide	Blue Grosbeak	Passeriformes	Emberizidae	*Guiraca*	28.4	More insects (beetles, bugs, caterpillars, grasshoppers, ants), than seeds (wheat, bristlegrass, corn, panicgrass)	37,53
C	Beltwide	Grasshopper Sparrow	Passeriformes	Emberizidae	*Ammodramus*	17.0	Mostly insects in summer (61%); prefers grasshoppers (Orthoptera). In winter, primarily seeds, especially panic grass and sedges.	89
C	Beltwide	Eastern Meadowlark	Passeriformes	Emberizidae	*Sturnella*	89.0	Feeds almost entirely on the ground. Diet consists of 74% insects, primarily crickets or grasshoppers, also caterpillars, cutworms, and grubs. In winter eats noxious weed seeds and waste grain supplemented slightly with wild fruits.	46
D	Beltwide	Mourning Dove	Columbiformes	Columbidae	*Zenaida*	119	99% seeds (corn, bristlegrass, pigweed, doveweed, sunflower, turkeymullein, fiddleneck)	53,56
D	Beltwide	Rock Dove	Columbiformes	Columbidae	*Columba*	354	Seeds, fruits, and rarely invertebrates. Domestic grains appear to be preferred.	41

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
D	Beltwide	American Goldfinch	Passeriformes	Fringillidae	*Carduelis*	12.9	Seeds of many annual plants, composites preferred, and small seeds of various trees, e.g. alder, birch, cedar and elm. Insects only as encountered.	55
F	Beltwide	Common Poorwill	Caprimulgiformes	Caprimulgidae	*Phalaenoptilus*	51.6	Night-flying insects, principally moths and beetles.	13
F	Beltwide	Common Nighthawk	Caprimulgiformes	Caprimulgidae	*Chordeiles*	61.5	Crepuscular, flying insects, especially flying ants, beetles and true bugs.	65
F	Beltwide	Barn Swallow	Passeriformes	Hirundinidae	*Hirundo*	16.0	Flying insects; insect: predominantly Diptera, then predaceous ground beetles, non-honey-bees, wasps, wingless ants. Very seldom will it eat seeds.	2,53
F	Beltwide	Northern Rough-winged Swallow	Passeriformes	Hirundinidae	*Stelgidopteryx*	15.9	Flying insects almost exclusively. Vegetable matter rarely eaten. Over 99% insects. Insects include Diptera, Hymenoptera, Hemiptera, and Coleoptera.	16
F	Beltwide	Purple Martin	Passeriformes	Hirundinidae	*Progne*	49.4	Flying insects at all times of year. Insects include beetles, true bugs, flies, dragonflies and damselflies, leafhoppers, grasshoppers and crickets, butterflies and moths, wasps and bees, caddis flies, and spiders.	4
F.1	Beltwide	Tree Swallow	Passeriformes	Hirundinidae	*Tachycineta*	14.4	Mostly flying insects, but will eat vegetable matter during unfavorable weather conditions. 80% animal, 20% plant. Insects primarily include Diptera, beetles, and ants, vegetable was primarily berries.	68

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
G	Beltwide	Brown-headed Cowbird	Passeriformes	Emberizidae	*Molothrus*	43.9	75% weeds and seeds (bristlegrass, panicgrass, ragweed, oats, wheat, doveweed), 25% grasshoppers, beetles and caterpillars	49,53
G	Beltwide	Common Grackle	Passeriformes	Emberizidae	*Quiscalus*	114	During breeding season takes insects and other invertebrates, some grain. During migration and winter, agricultural grain or seeds and tree seeds, some fruit. A year round average of 70-75% plant and 25-30% animal. Insects are primarily Coleoptera, Orthoptera, and Lepidoptera. Seeds are mostly agricultural grains such as corn.	64
G	Beltwide	Red-winged Blackbird	Passeriformes	Emberizidae	*Agelaius*	52.6	Non-breeding - mostly plant (rice in LA, otherwise panicgrass, bristlegrass, corn, oats, wheat), breeding – primarily animal, but varies with access to agricultural fields (weevils, beetles, caterpillars, grubs, cankerworms, grasshoppers, ants)	53,94
K	Beltwide	Gray Catbird	Passeriformes	Mimidae	*Dumetella*	36.9	Primarily insects and small fruits. Insects include Hymenoptera, Coleoptera, Orthoptera, Diptera, Lepidoptera, Homoptera, Neuroptera, Odonata, and spiders.	11
K	Beltwide	Northern Mockingbird	Passeriformes	Mimidae	*Mimus*	48.5	Omnivorous: spring and summer insects (beetles, ants, bees, wasps, grasshoppers), fall and winter more than 50% fruit (holly, greenbriar, pokeweed, Virginia creeper, hackberry)	17,53

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
K	Beltwide	Northern Flicker	Piciformes	Picidae	*Colaptes*	132	Ants and predaceous ground beetles, shifting to fruits in late fall and winter	58
L	Beltwide	Scaled Quail	Galliformes	Phasianidae	*Callipepla*	184	Feeds mainly on seeds of forbs, shrubs and grains, with forb seeds and grains main fall and winter food. Insects and herbaceous leaves consumed on a seasonal basis. Animal matter is 21% in spring and summer.	80
M	Beltwide	Mallard Duck	Anseriformes	Anatidae	*Anas*	956	Seeds of grasses, reeds, trees, bushes; waste grain, freshwater snails & mollusks, aquatic insects, tadpoles, fishes/eggs	85
N	Beltwide	Green Heron (formerly Green-backed Heron)	Ciconiiformes	Ardeidae	*Butorides*	212	Typically a fish-eater, but includes many invertebrates.	15
N	Beltwide	Black-crowned Night Heron	Ciconiiformes	Ardeidae	*Nycticorax*	883	Opportunistic; takes leeches, earthworms, aquatic and terrestrial insects, prawns and crayfish, mussels, squid, freshwater and marine fish, amphibians, lizards, snakes, rodents, birds eggs, carrion, plant materials, and garbage.	14
N	Beltwide	Great Blue Heron	Ciconiiformes	Ardeidae	*Ardea*	2390	Mostly fish, but also amphibians, invertebrates, reptiles, mammals and birds.	8
O	Beltwide	Spotted Sandpiper	Charadriiformes	Scolopacidae	*Actitis*	-	Mainly freshwater, marine and terrestrial invertebrates. Occasionally small fish.	62

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Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
P	Beltwide	Northern Harrier	Falconiformes	Accipitridae	*Circus*	436	Summer: small- and medium-sized mammals, primarily rodents, birds (chiefly passerines and small waterbirds), reptiles and frogs. Winter: in northern parts of range, almost exclusively *Microtus* voles; in southern part, mammals and birds. In southeastern coastal marshes devoid of mammals, takes passerines and waterbirds.	51
P	Beltwide	Red-tailed Hawk	Falconiformes	Accipitridae	*Buteo*	1130	Small to medium-sized mammals, birds and reptiles. Generally more mammals than other taxa.	67
P	Beltwide	Swainson's Hawk	Falconiformes	Accipitridae	*Buteo*	988	Mainly vertebrates, including mammals, birds and reptiles during breeding season and invertebrates (esp. grasshoppers and dragonflies) at other times.	21
P	Beltwide	Loggerhead Shrike	Passeriformes	Laniidae	*Lanius*	47.4	Eats arthropods, amphibians, small to medium-sized reptiles, small mammals and birds. Also roadkill, and carrion. 68% insects, 4% spiders, and 28% vertebrates.	94
P	Beltwide	Barn Owl	Strigiformes	Tytonidae	*Tyto*	524	Small mammals. Birds consumed in only very small numbers, and usually roosting birds such as European Starlings or blackbirds.	52
Q	Beltwide	Cooper's Hawk	Falconiformes	Accipitridae	*Accipiter*	439	Typically live subadult birds and mammals having masses ranges from about 50 – 130 g. Primarily birds.	75
A	West	Verdin	Passeriformes	Paridae	*Auriparus*	6.8	Insects/larvae/ eggs, wild fruits and berries.	2

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
A	West	Common Yellowthroat	Passeriformes	Emberizidae	*Geothlypis*	10.1	Eats insects such as small grasshoppers, dragonflies, damselflies, mayflies, beetles, grubs, cankerworms and other caterpillars, moths, butterflies, flies, ants, aphids, leafhoppers, leaf rollers, and spiders. Apparently no plant matter.	85
A	West	Blue-gray Gnatcatcher	Passeriformes	Muscicapidae	*Polioptila*	6.0	Consumes small insects and spiders by gleaning, gleaning while hovering, or capturing flushed prey. Prey include Homoptera, Hemiptera, Coleoptera, Araneae.	20
A	West	Bewick's Wren	Passeriformes	Troglodytidae	*Thryomanes*	9.9	Mainly eats arthropod larvae and adults, with limited vegetable matter (<3%). Insects include: Hemiptera, Coleoptera, Hymenoptera, Lepidoptera, Orthoptera, Diptera, and spiders.	42
B	West	Lucy's Warbler	Passeriformes	Emberizidae	*Vermivora*	6.6	Largely, if not wholly insects; including Araneae, Hemiptera, Coleoptera, Homoptera, Diptera, Hymenoptera, Lepidoptera.	40
B	West	White-faced Ibis	Ciconiiformes	Threskiornithidae	*Plegadis*	622	Mainly aquatic and moist-soil larval and adult insects, crustaceans and earthworms.	78
C	West	Abert's Towhee	Passeriformes	Emberizidae	*Pipilo*	46.0	Primarily insects 73 - 96% (beetles, caterpillars, ants, moths, grasshoppers, crickets, and bugs), rest seeds (fiddleneck, crownbeard, bristlegrass)	53,88

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
C	West	Black-headed Grosbeak	Passeriformes	Emberizidae	*Pheucticus*	42.0	57% animal matter and 43% vegetable matter. Animal matter consists primarily of insects and spiders, and vegetable matter is primarily cultivated fruit and weed seeds.	34
C	West	Lark Sparrow	Passeriformes	Emberizidae	*Chondestes*	29.0	Insects (grasshoppers, beetles, caterpillars) and seeds (wheat, redmaids, oats, knotweed); 27% animal, 73% seeds.	2,53
C	West	Lazuli Bunting	Passeriformes	Emberizidae	*Passerina*	15.5	Eats seeds and fruits throughout the year. Gleens arthropods from foliage(53-64%), especially during breeding season. Arthropods include spiders, caterpillars, butterflies, grasshoppers, beetles, ants, and bugs. Plant matter includes wild oats, miner's lettuce, canary grass, needle grass, and chickweed.	26
C	West	Spotted Towhee (Formerly Rufous-sided Towhee)	Passeriformes	Emberizidae	*Pipilo*	40.5	In breeding season, chief invertebrate food is Coleoptera including ground beetles, weevils, darkling beetles, blister beetles, long-horned beetles, lady beetles, leaf beetles, other beetles, Orthoptera, Hemiptera, Hymenoptera, Diptera, Lepidoptera, Homoptera, spiders, millipedes, sowbugs. Seeds and fruits of smartweed, chickweed, raspberry and blackberry, thistle, oats, wheat, nightshade, and dock. Plant matter – 76% and animal matter – 24%	28

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
C	West	Western Meadowlark	Passeriformes	Emberizidae	*Sturnella*	101	Feeds almost entirely on the ground. 37% vegetable and 63% animal. Plant food is primarily grain with weed seeds. Animal food consists of Coleoptera, Orthoptera, Lepidoptera, Hemiptera, Hymenoptera, Diptera, and Arachnida.	45
D	West	Inca Dove	Columbiformes	Columbidae	*Columbina*	47.5	Grains, weed and grass seeds.	60
E	West	Canyon Towhee	Passeriformes	Emberizidae	*Pipilo*	44.4	Mostly seeds: some as small as 0.5 mm in diameter, few insects. Seeds include commercial bird seed, including milo, millet, and sunflower seeds, otherwise, panicum, sorrel, chickweed, pigweed and lupine, also a few fruits. Invertebrates include Orthoptera, millipedes, snails and spiders.	39
F	West	Lesser Nighthawk	Caprimulgiformes	Caprimulgidae	*Chordeiles*	49.9	Night-flying insects in the range of leafhoppers to cicadas.	48
F	West	Cliff Swallow	Passeriformes	Hirundinidae	*Hirundo*	21.6	Swarming, flying insects, most commonly Hymenoptera, Hemiptera, Homoptera, Coleoptera, and Diptera; very few seeds which may accidental or for grit.	5,53
F	West	Violet-green Swallow	Passeriformes	Hirundinidae	*Tachycineta*	14.2	Flying insects exclusively.	6

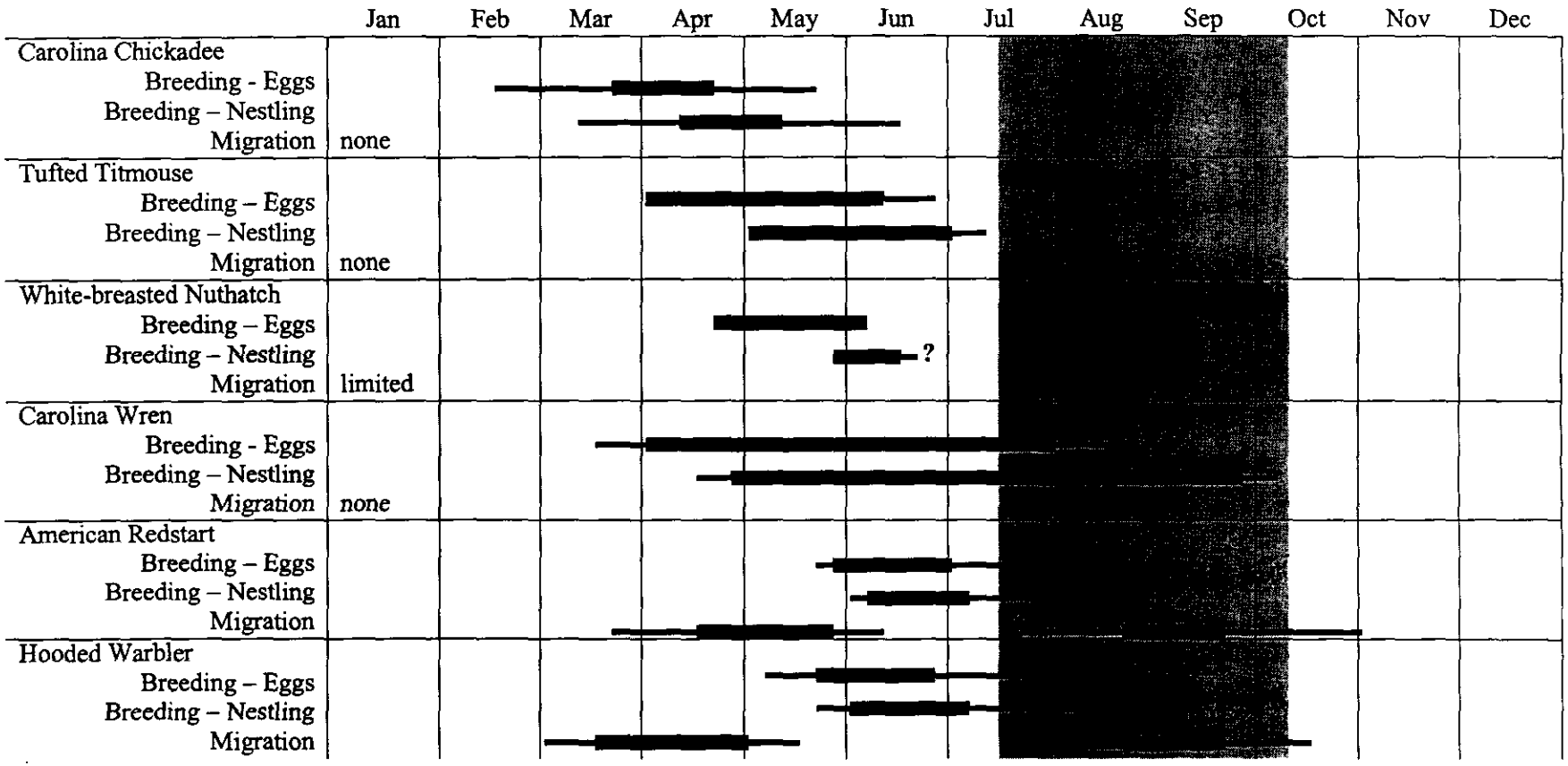
Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
F.1	West	Black Phoebe	Passeriformes	Tyrannidae	*Sayornis*	18.6	Mainly flying insects, but insects and other arthropods are often gleaned from other surfaces. Some individuals adapt to capturing small fish. Sometimes eats small berries. 99% insects and 1% fruit. Most common insects are bees and wasps, flies, beetles, damselflies, and dragonflies.	92
F.1	West	Western Kingbird	Passeriformes	Tyrannidae	*Tyrannus*	45.6	Consumes insects primarily by capturing in the air or will glean from the ground or off vegetation, also eats fruits of various plants. Insects consumed include Hymenoptera, Hemiptera, Orthoptera, Lepidoptera, Diptera, Coleoptera, and spiders.	23
G	West	Bronzed Cowbird	Passeriformes	Emberizidae	*Molothrus*	62.0	Eats mainly seeds and arthropods. Mostly seeds of grasses, weeds, and grain crops.	50
G	West	Yellow-headed Blackbird	Passeriformes	Emberizidae	*Xanthocephalus*	64.5	During breeding season specializes in "aquatic" prey; feeds aquatic insects, including emerging adults, to nestlings. Consumes primarily cultivated grains and weed seeds during the post breeding season.	86
J	West	Greater Roadrunner	Cuculiformes	Cuculidae	*Geococcyx*	376	Omnivorous and opportunistic: insects, spiders, scorpions, centipedes, millipedes, lizards, small snakes, birds, eggs, rodents, carrion, plant material. About 90% animal matter with fruit and seeds taken seasonally.	36

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
J	West	Le Conte's Thrasher	Passeriformes	Mimidae	*Toxostoma*	61.9	Arthropods and some plant seeds, may take bird eggs, small snakes and lizards. Will consume just about any arthropod encountered. Approximately 92% is arthropods.	81
K	West	Orchard Oriole	Passeriformes	Emberizidae	*Icterus*	19.6	During breeding season, insects and spider, changing to ripe fruit with season. In winter, fruit, nectar, and insects. In May-June, 91% is animal, including Hymenoptera, Hemiptera, Lepidoptera, Orthoptera, Coleoptera, Arachnida, and Ephemeroptera,	79
K	West	Summer Tanager	Passeriformes	Emberizidae	*Piranga*	28.2	Bee and wasp specialist. Also takes a wide variety of flying and nonflying insects. During nonbreeding and migration, regularly takes fruit.	72
K	West	Curve-billed Thrasher	Passeriformes	Mimidae	*Toxostoma*	79.4	Mainly arthropods and gastropods. In fall Coleoptera, and berries; in spring, Coleoptera, Gastropoda, and Crustacea. Approximately 95% animal and 5% plant.	87
L	West	Gambel's Quail	Galliformes	Phasianidae	*Callipepla*	166	Wide variety of plants with leafy material, especially legumes, seeds from legumes and others, seeds single most important food category (mesquite, deervetch, Russian thistle, lupine, alfalfa) and insects (beetles, true bugs, grasshoppers, crickets, leafhoppers, ants, spiders); 99.5% plant, rest various insects.	2,38,53

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
M	West	Cinnamon Teal	Anseriformes	Anatidae	*Anas*	386	Omnivorous diet consisting of seeds and aquatic vegetation, aquatic and semi-terrestrial insects, snails and zooplankton.	10
M	West	Northern Shoveler	Anseriformes	Anatidae	*Anas*	613	Eats small nektonic (swimming) invertebrates and seeds by straining water column.	18
O	West	American Avocet	Charadriiformes	Recurvirostridae	*Recurvirostra*	316	In freshwater wetlands: water boatmen, adult and larval beetles, fly larvae (esp. midges), seeds of marsh or aquatic plants (esp. sago pondweed, salt grass, and bull rushes), and brine flies in more saline wetlands. In permanent shallow lakes and inland sloughs: amphipods. In saline inland wetlands: brine shrimp, brine flies, and fairy shrimp. Also will consume terrestrial invertebrates, small fish, and amphibians.	69
O	West	Marsh Wren	Passeriformes	Troglodytidae	*Cistothorus*	11.3	Primarily invertebrates, especially insects and spiders, aquatic insects in freshwater marshes. Major invertebrate groups include Hymenoptera, Coleoptera, Homoptera, Diptera, Lepidoptera, Hemiptera, and Araneidae	43
P	West	Burrowing Owl	Strigiformes	Strigidae	*Speotyto*	156	Opportunistic taking primarily arthropods, small mammals, and birds; amphibians and reptiles also reported.	32
R	West	Anna's Hummingbird	Apodiformes	Trochilidae	*Calypte*	4.2	Nectar from many species of flowers, very small insects and spiders	77

Group	Region	Species	Order	Family	Genus	Body Weight (g)	Diet	Reference
R	West	Broad-tailed Hummingbird	Apodiformes	Trochilidae	*Selasphorus*	3.6	Floral nectar and small insects	9

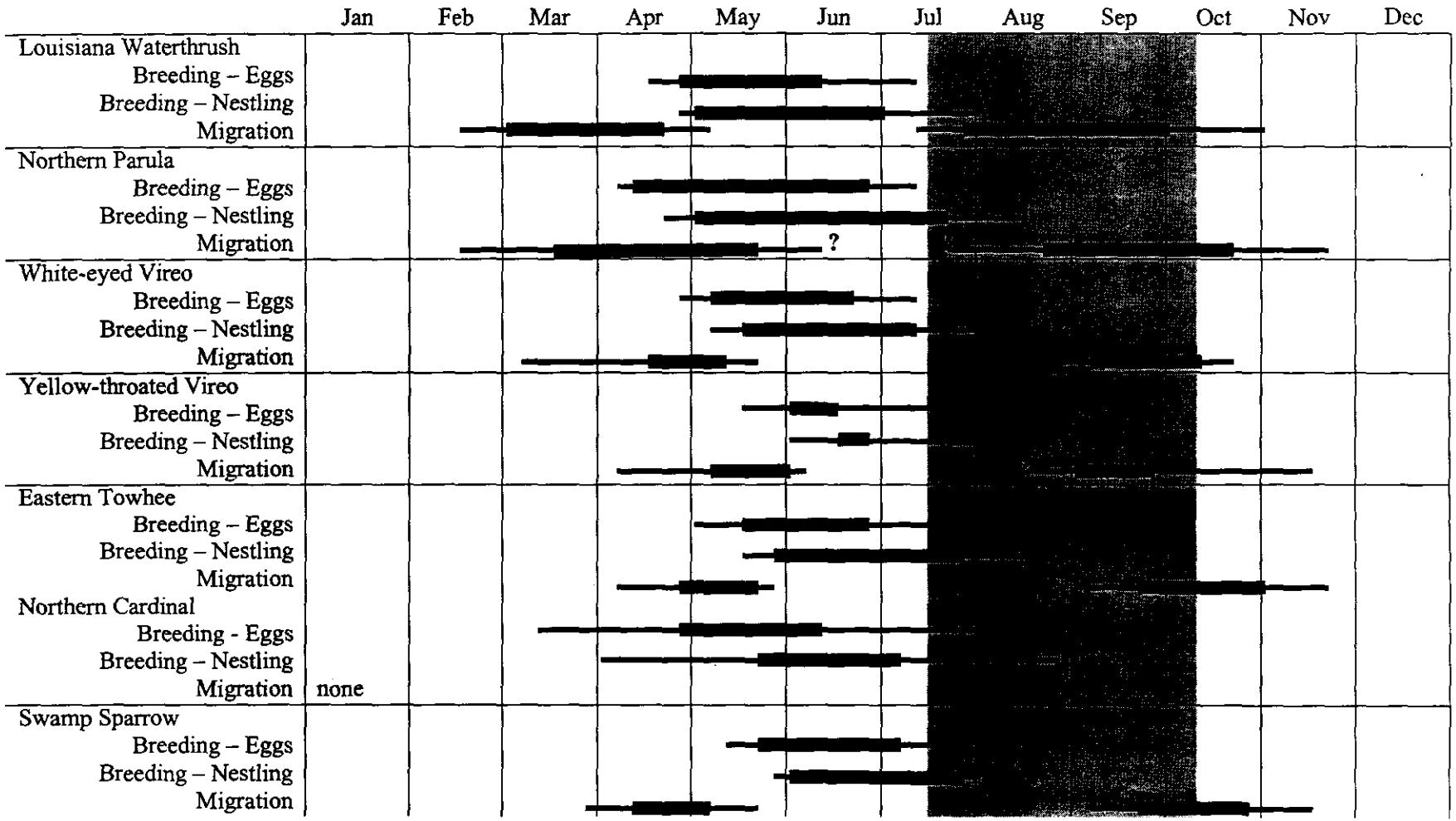
Breeding, and migration times for birds known to occur on or around Southern cotton fields (Texas and eastward). Shaded portions indicate times when PIRATE applications are possible.



Thin lines indicate the overall duration of the activity, thicker lines indicate the peak periods.

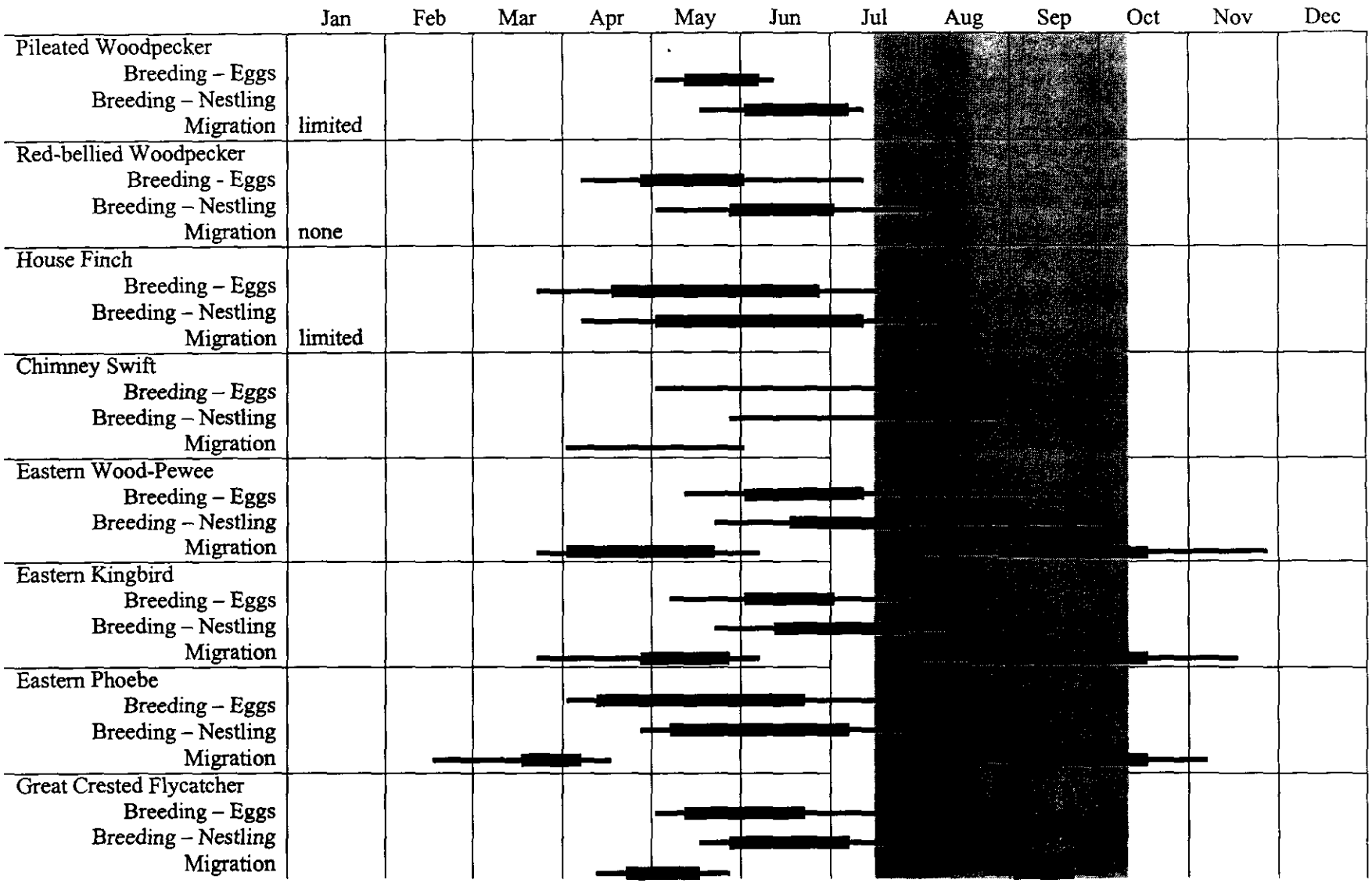
248

CY190


Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Louisiana Waterthrush
Breeding – Eggs
Breeding – Nestling
Migration
Northern Parula
Breeding – Eggs
Breeding – Nestling
Migration
?
White-eyed Vireo
Breeding – Eggs
Breeding – Nestling
Migration
Yellow-throated Vireo
Breeding – Eggs
Breeding – Nestling
Migration
Eastern Towhee
Breeding – Eggs
Breeding – Nestling
Migration
Northern Cardinal
Breeding - Eggs
Breeding – Nestling
Migration
none
Swamp Sparrow
Breeding – Eggs
Breeding – Nestling
Migration

249

CY190



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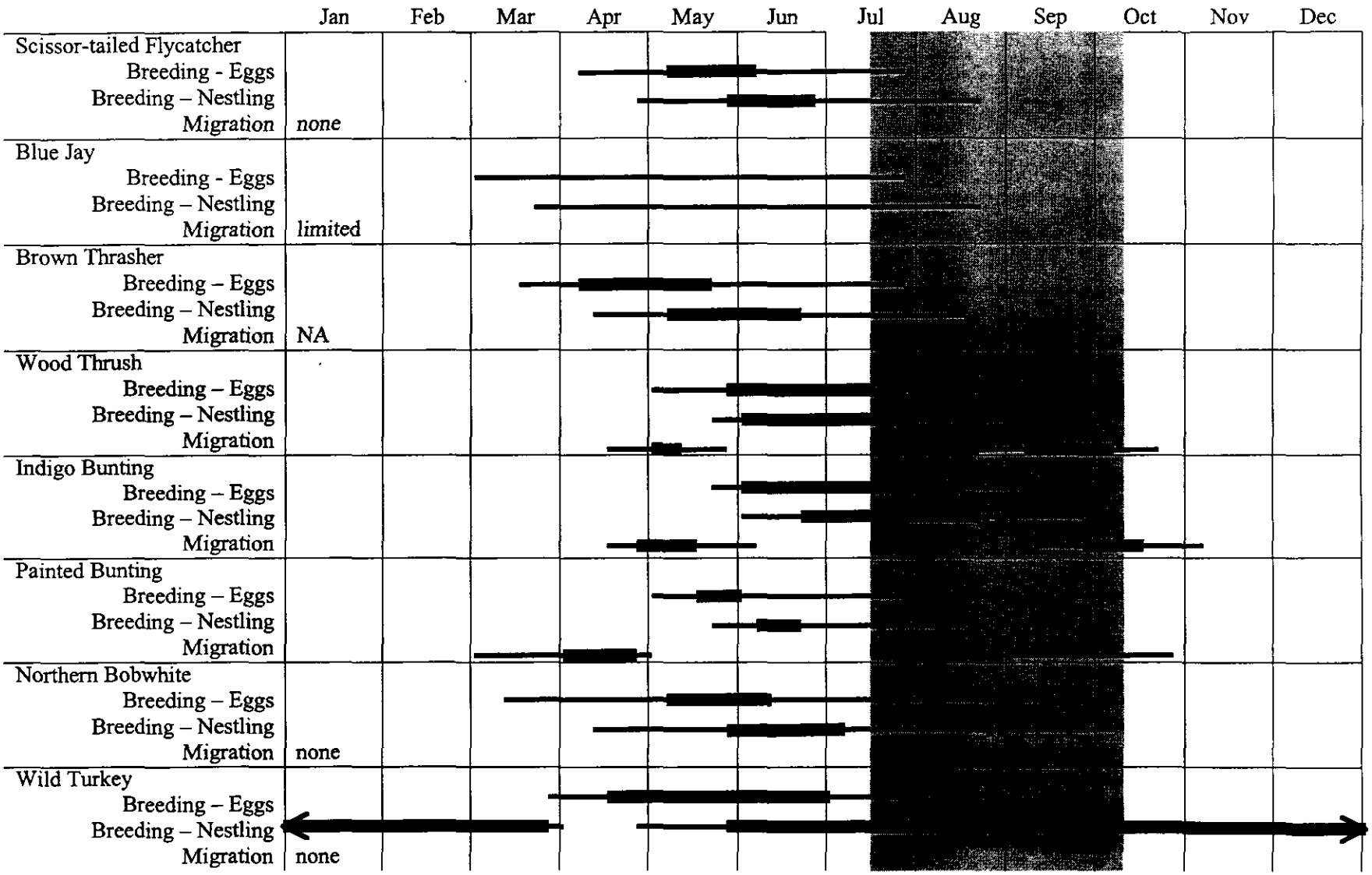

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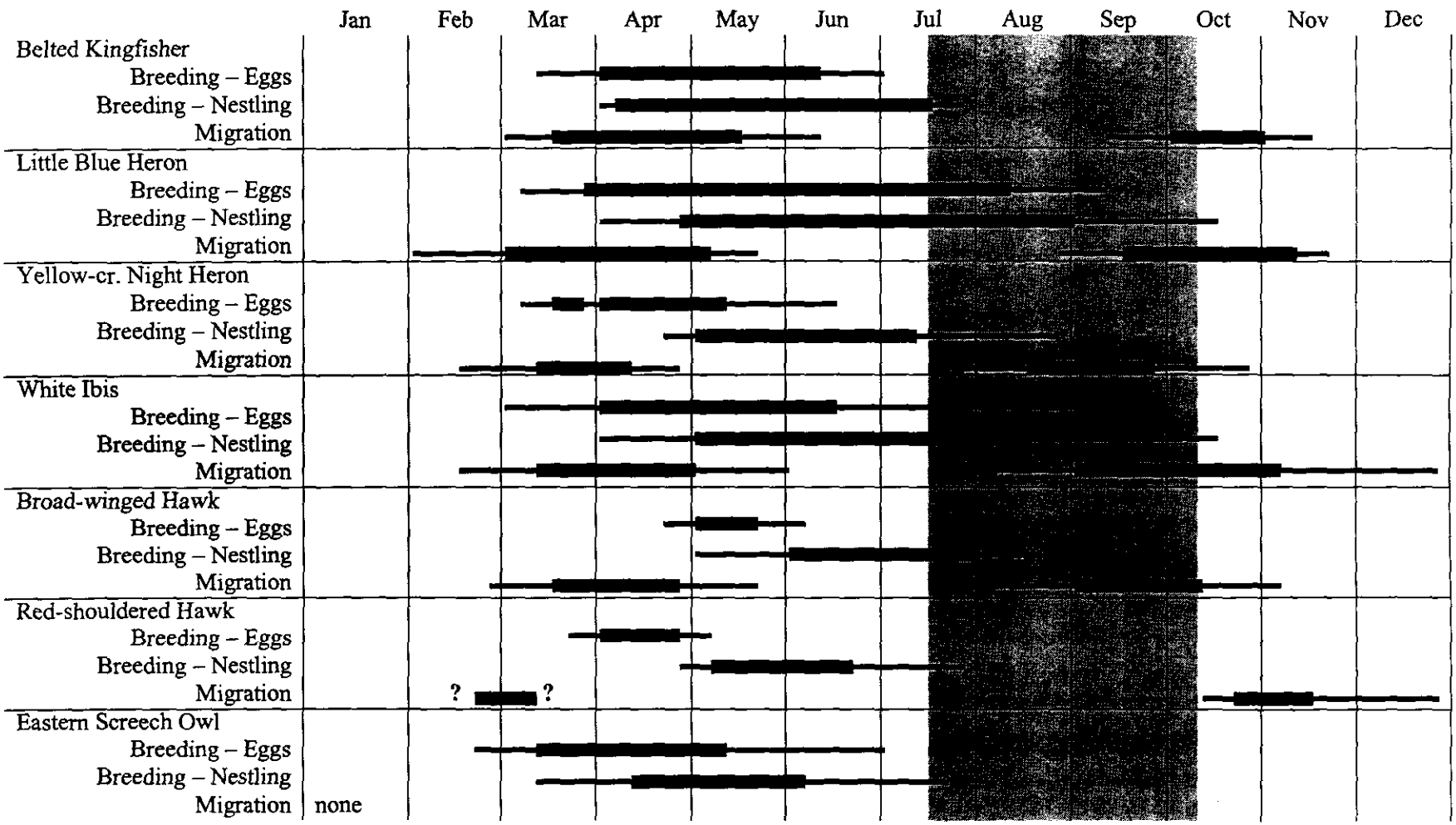
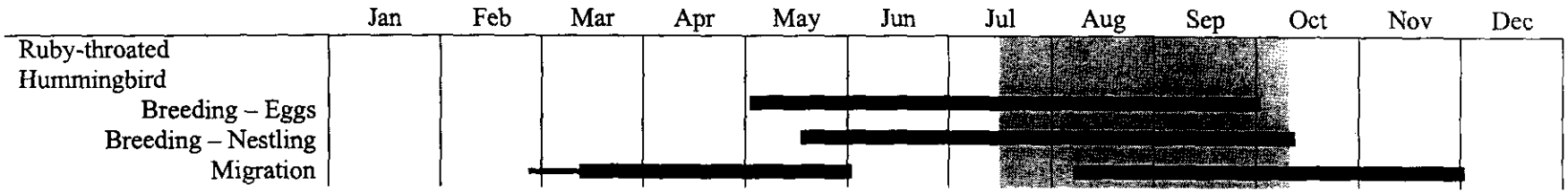

Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Belted Kingfisher
Breeding – Eggs
Breeding – Nestling
Migration
Little Blue Heron
Breeding – Eggs
Breeding – Nestling
Migration
Yellow-cr. Night Heron
Breeding – Eggs
Breeding – Nestling
Migration
White Ibis
Breeding – Eggs
Breeding – Nestling
Migration
Broad-winged Hawk
Breeding – Eggs
Breeding – Nestling
Migration
Red-shouldered Hawk
Breeding – Eggs
Breeding – Nestling
Migration
? ?
Eastern Screech Owl
Breeding – Eggs
Breeding – Nestling
Migration
none

252

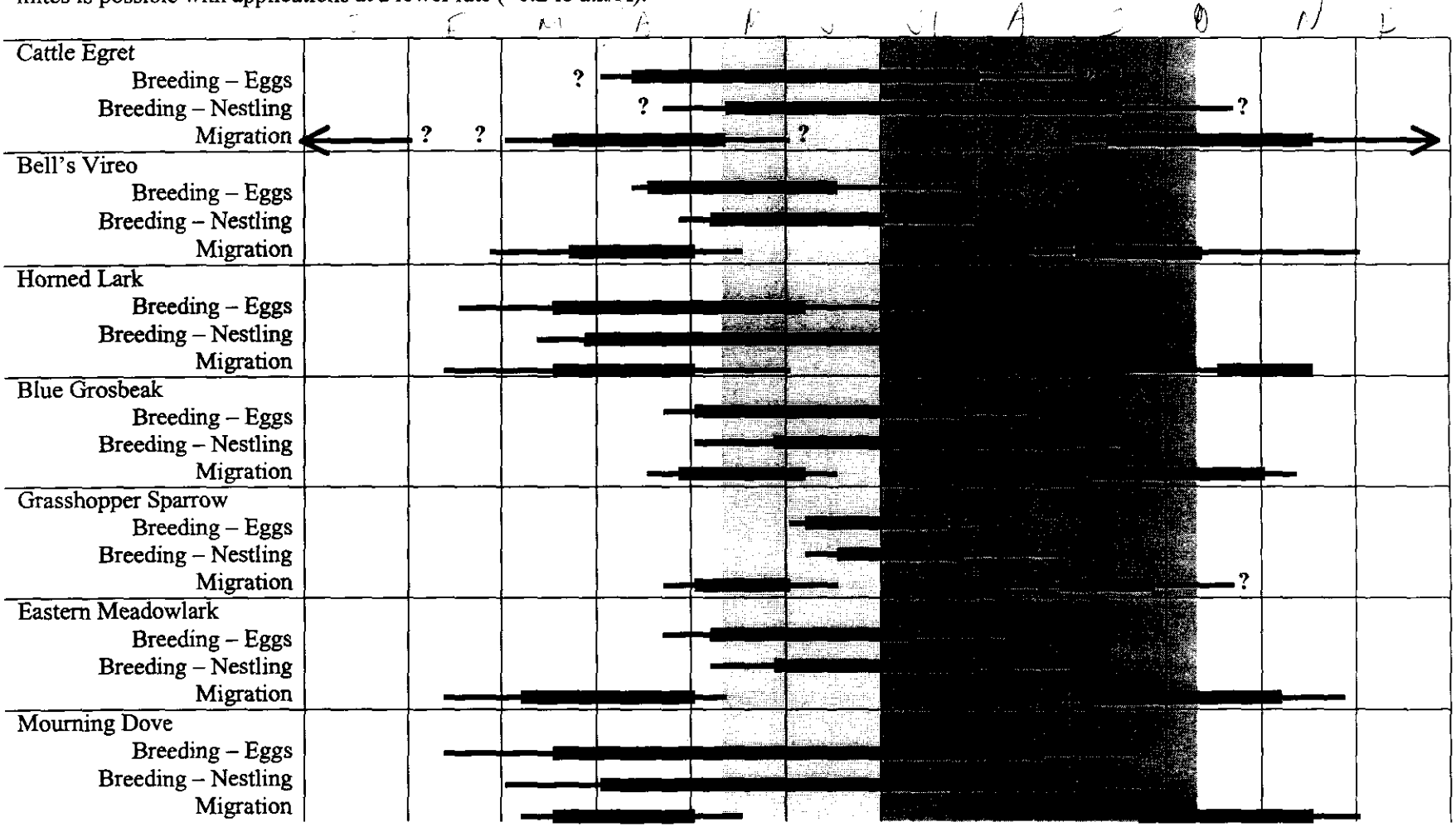
CY190


Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Ruby-throated Hummingbird
Breeding – Eggs
Breeding – Nestling
Migration

253

CY/190

Breeding, and migration times for birds known to occur on or around cotton fields throughout the cotton belt of the southern United States. Shaded portions indicate times when PIRATE or ALERT applications are possible. The lighter shading indicates when early season control for mites is possible with applications at a lower rate (<0.2 lb a.i./A).



254

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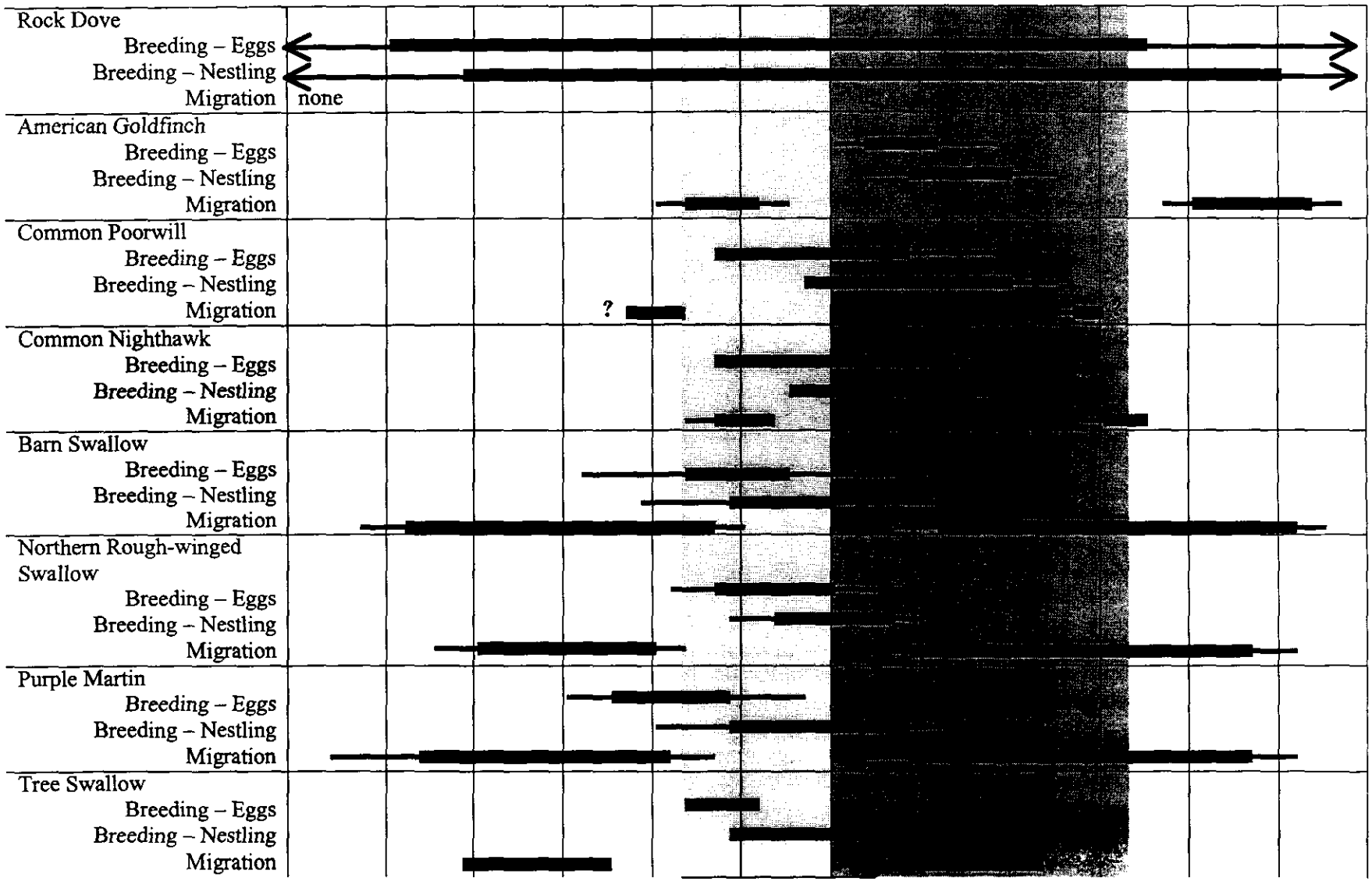
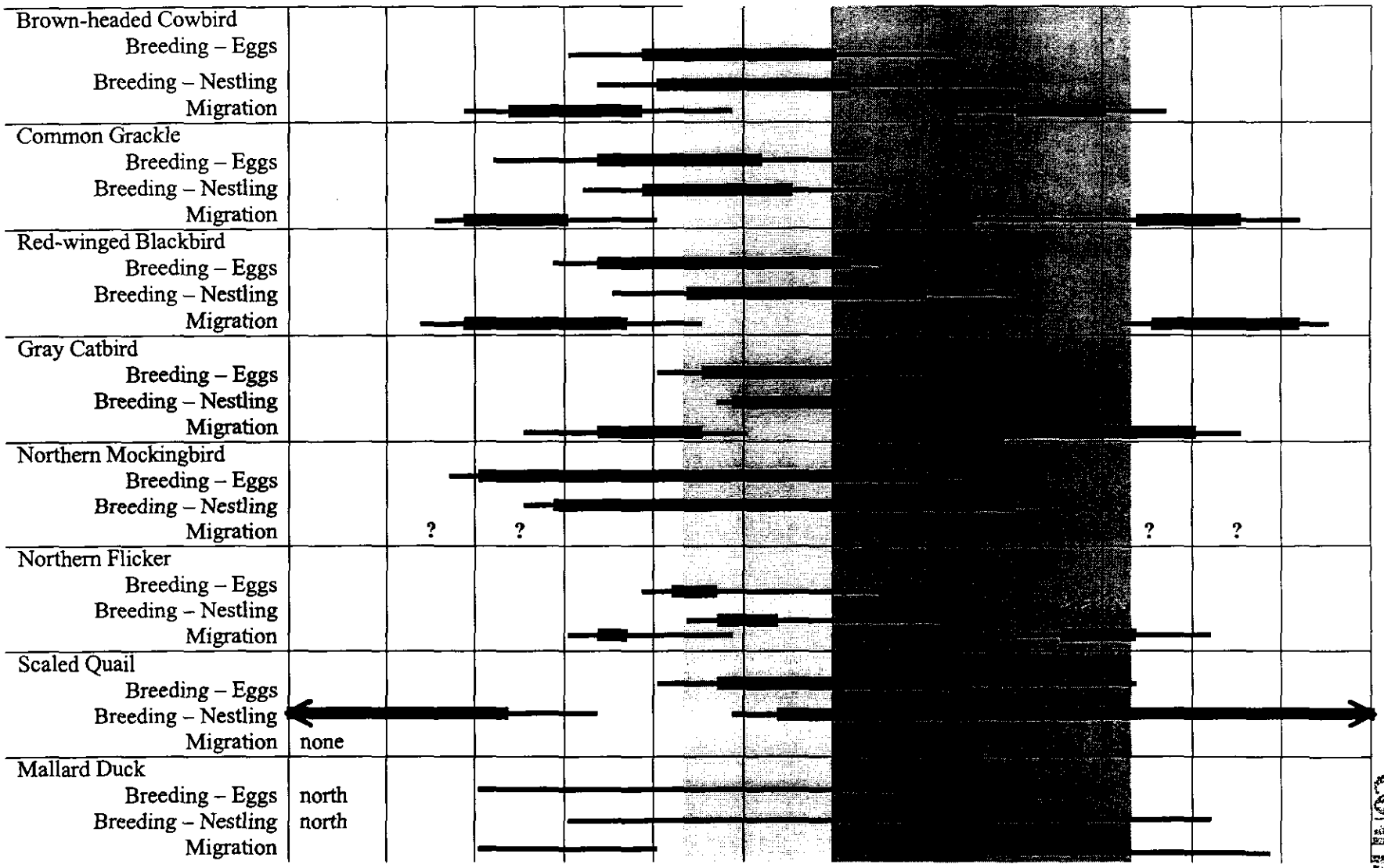

Rock Dove
Breeding – Eggs
Breeding – Nestling
Migration
none
American Goldfinch
Breeding – Eggs
Breeding – Nestling
Migration
Common Poorwill
Breeding – Eggs
Breeding – Nestling
Migration
?
Common Nighthawk
Breeding – Eggs
Breeding – Nestling
Migration
Barn Swallow
Breeding – Eggs
Breeding – Nestling
Migration
Northern Rough-winged Swallow
Breeding – Eggs
Breeding – Nestling
Migration
Purple Martin
Breeding – Eggs
Breeding – Nestling
Migration
Tree Swallow
Breeding – Eggs
Breeding – Nestling
Migration

255

CY/90



256

CY190

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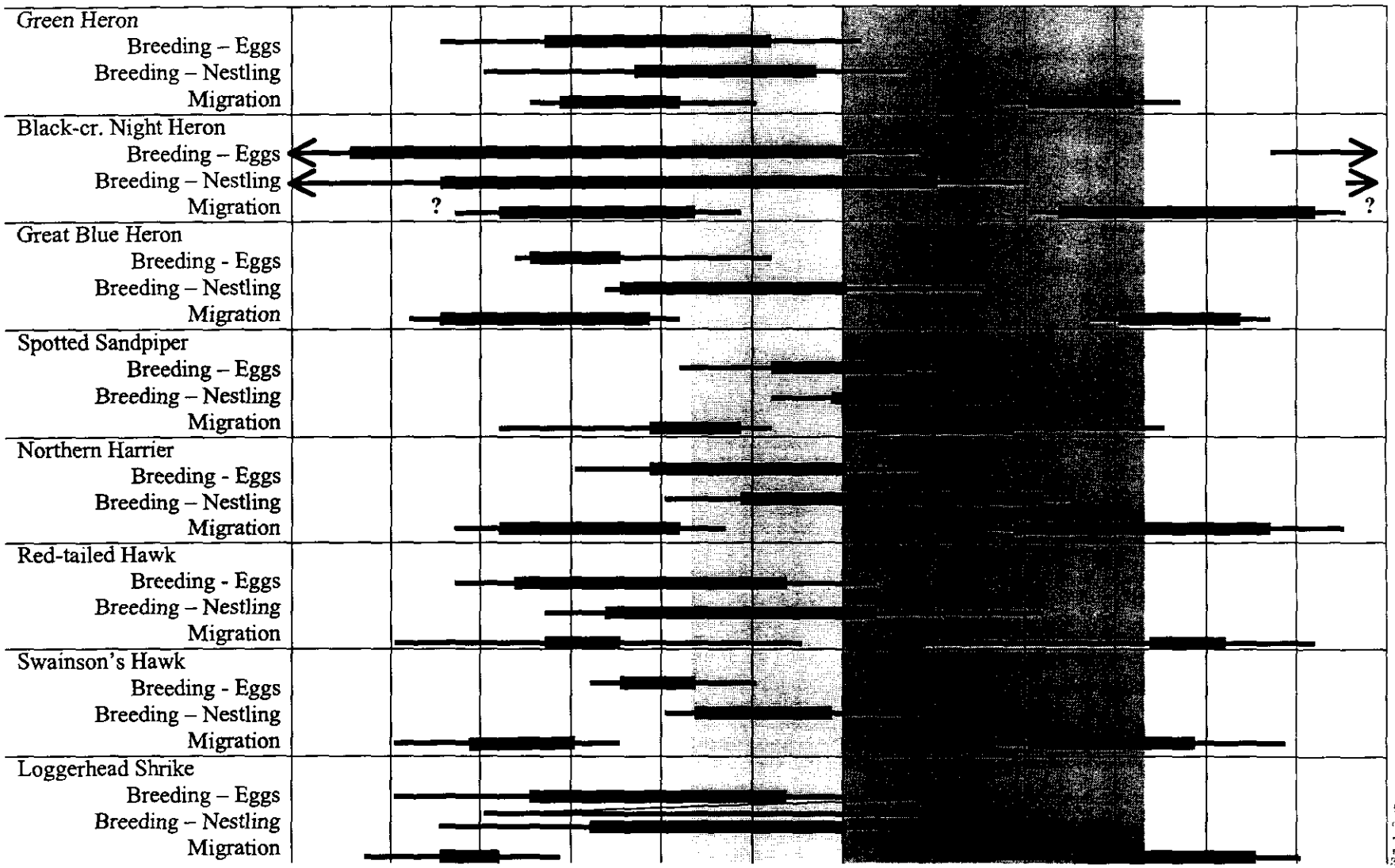

257

CY190

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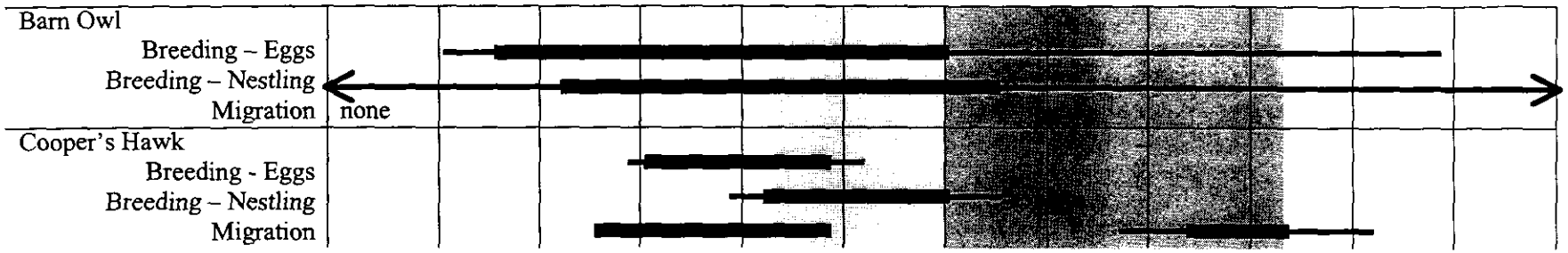
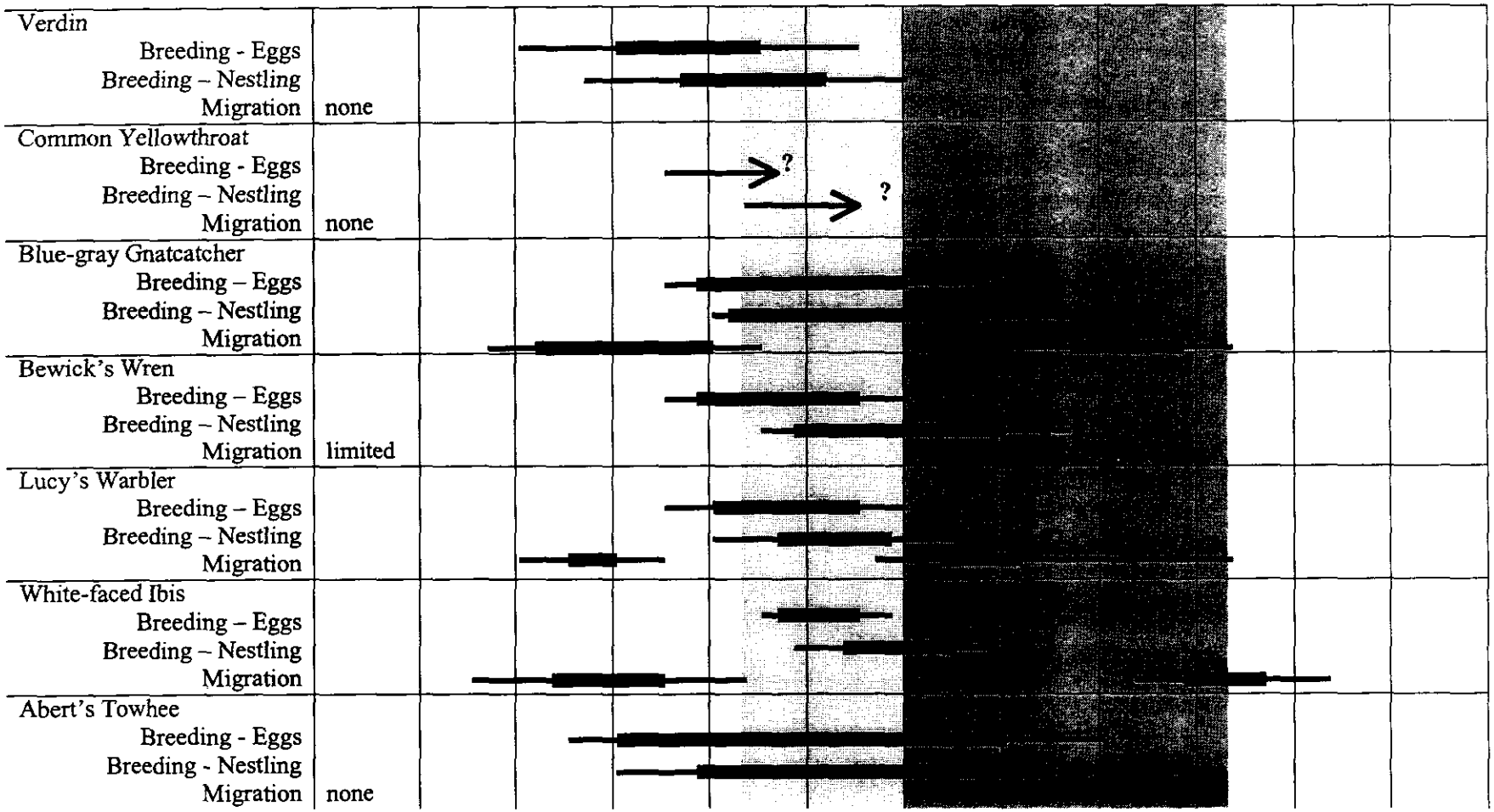


258

CY190

Breeding, and migration times for birds known to occur on or around western cotton fields . Shaded portions indicate times when ALERT applications are possible. The lighter shading indicates when early season control for mites is possible with applications at a lower rate (<0.2 lb a.i./A).



259

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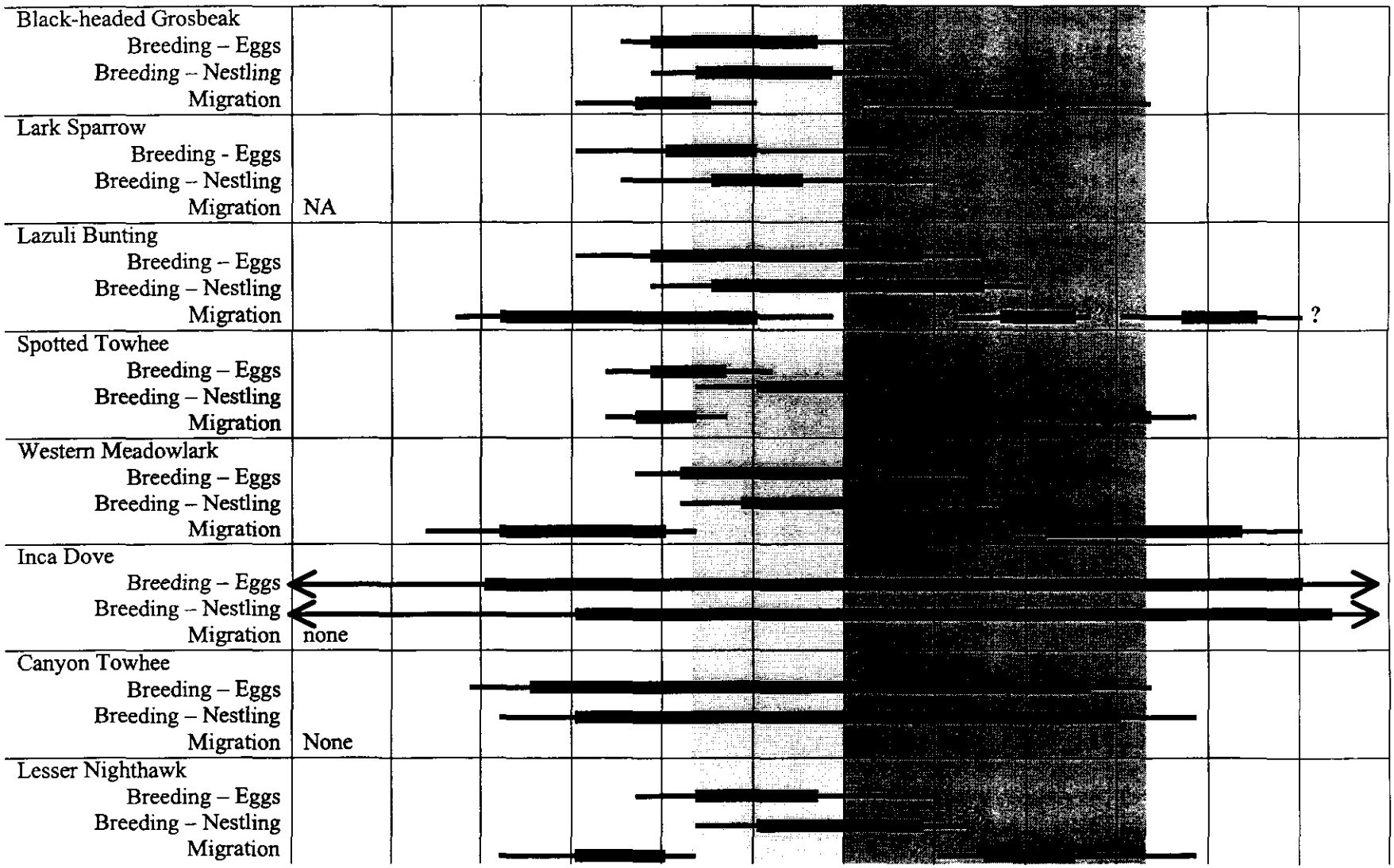
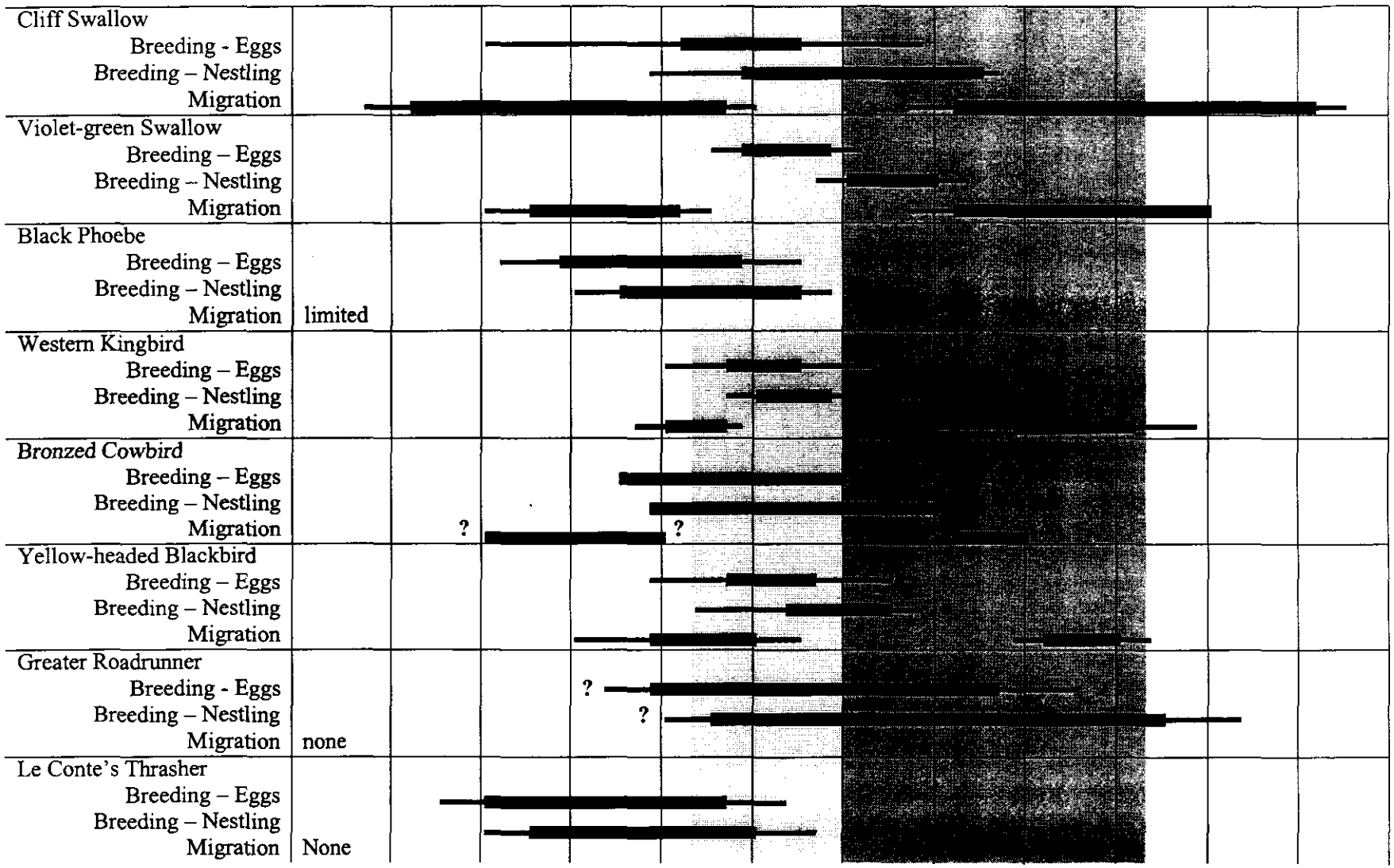

Black-headed Grosbeak
Breeding – Eggs
Breeding – Nestling
Migration
Lark Sparrow
Breeding - Eggs
Breeding – Nestling
Migration
NA
Lazuli Bunting
Breeding – Eggs
Breeding – Nestling
Migration
?
?
Spotted Towhee
Breeding – Eggs
Breeding – Nestling
Migration
Western Meadowlark
Breeding – Eggs
Breeding – Nestling
Migration
Inca Dove
Breeding – Eggs
Breeding – Nestling
Migration
none
Canyon Towhee
Breeding – Eggs
Breeding – Nestling
Migration
None
Lesser Nighthawk
Breeding – Eggs
Breeding – Nestling
Migration

260

CY190



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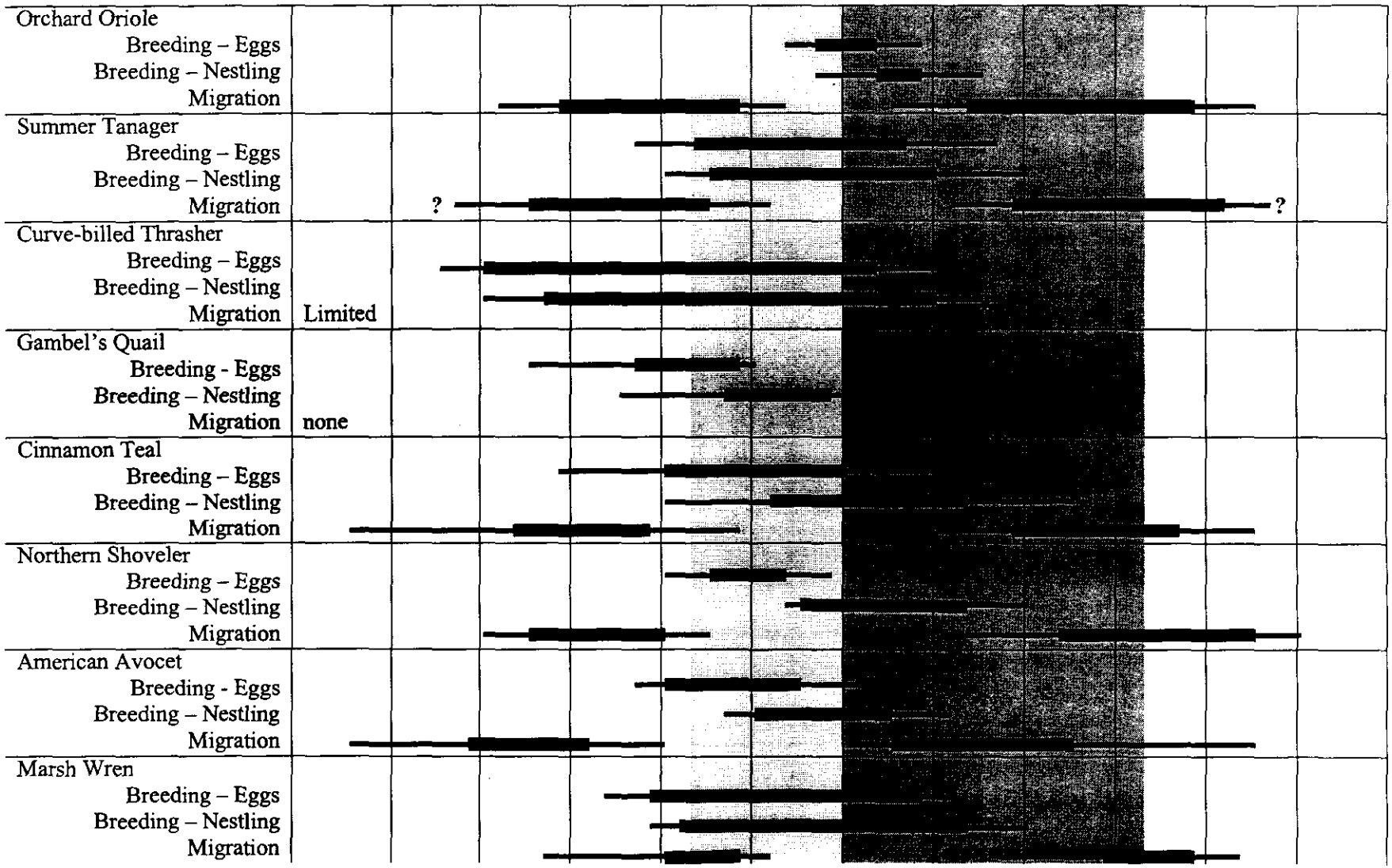

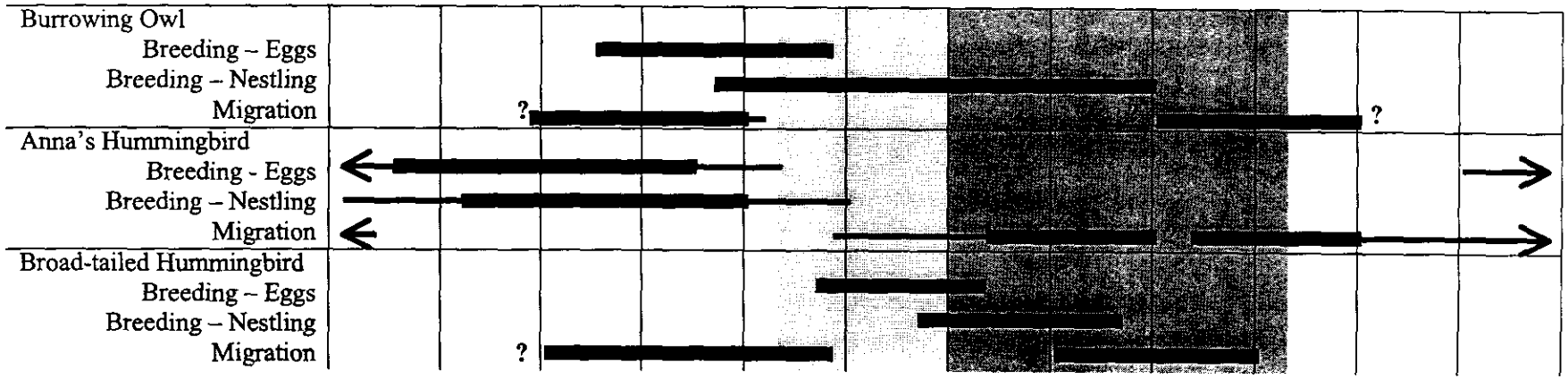

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CY/90

General breeding and range data for species observed in or around cotton fields in the southern United States (Texas and eastward).

Species	Breeding Habitat	Nesting Site	Breeding Range	Wintering Range	Migration Route
Carolina Chickadee			se KS up to s PA, south to eastcentral TX, gulf coast, and c. FL	Same as breeding	nonmigratory
Tufted Titmouse	Limited mostly to deciduous forests but can occupy mixed deciduous-coniferous forests, also swamps, orchards, parks and suburban areas.	Natural holes and old woodpecker cavities varying from 1 – 28 m.	Breeds from NW Texas, SE Nebraska, SE Minnesota, S Wisconsin, S Michigan, S Ontario, N Ohio, NW Pennsylvania, central New York, W Massachusetts, S Vermont, and S Maine to S Florida and N Mexico.	Same as breeding.	Nonmigratory.
White-breasted nuthatch	Generally mature deciduous woodland, but also mixed deciduous and coniferous forest. Usually avoids boreal coniferous forest.	Nests in natural cavities or old woodpecker holes. Cavity height varies from 5 – 20 m off ground	Breeds across S Canada from British Columbia to Prince Edward Island and Maritime Provinces south to central and E Texas and central Florida, into Mexico and Baja Mexico. Absent from treeless Great Plains, and absent from the semiarid shrub and scrub steppe of the Great Basin and Sonoran Desert.	Same as breeding.	Only some irruptive movements in some years.

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Cy/190

Species	Breeding Habitat	Nesting Site	Breeding Range	Wintering Range	Migration Route
Carolina wren	Wide range of habitats from brushy clear-cuts and lowland cypress swamps to hemlock- and rhododendron-choked ravines. Require moderate to dense shrub or brush cover.	Nests in tree cavities, tree crotches, vine tangles, conifer branches, upturned roots, overhangs, and tree stumps; also such artificial substrates such as abandoned cars, inside garages, old shoes, bird boxes, shelves, mailboxes, pockets of old coats, and similar receptacles.	Extends from se Iowa, s Michigan, se Ontario, S New York, Connecticut and se Massachusetts south to e Mexico, the Gulf Coast, and s Florida, west to central Kansas, central Oklahoma, and central Texas. Probable breeding also in w. Kansas, w. Oklahoma, and NW. Texas.	Same.	Not migratory, but may wander.

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CY190

Species	Breeding Habitat	Nesting Site	Breeding Range	Wintering Range	Migration Route
American Redstart	Generally prefers moist, deciduous, second-growth woodlands with abundant shrubs, often near water, especially in southern and western parts of range.	Nests usually surrounded by foliage within well-vegetated sites, usually against main trunk of live tree or in leafy woody shrub. Often builds nests over or near water. Also nests in swamps or along streams.	Breeds north to Newfoundland, S Labrador, S-central Quebec, N-central Ontario, central Manitoba, N-central Saskatchewan, NE Alberta, W-central Mackenzie, and extreme SW Yukon south to SE Virginia, Central North Carolina, extreme W South Carolina, N and W Georgia, extreme NW Florida, S Alabama, S Mississippi, S Louisiana; easternmost portions of Texas, Oklahoma, and Kansas; SE and N Nebraska, SE and NW Wyoming, N Idaho; NW Oregon, N Washington, W-central British Columbia, and extreme SE Alaska.	Winters in along coast of S and central California, Baja California, along the coasts of Mexico, Central America, South America, Caribbean Islands, and extreme S Florida.	In fall, migrates primarily along Coastal Plain along the Atlantic Coast. Also broad migratory front across U.S.
Hooded Warbler	Territories usually include small clearings where a shrub understory is available for nesting. Typically inhabit mature forests where trees are large enough to create significant tree fall gaps.	Patches of shrub within forest and along edge of forest. Nest often placed near edge of distinct patch of shrub, and often easily visible.	Breeds from SE Nebraska to S Great Lakes region, east to the Atlantic Coast south to SE Texas, U.S. Gulf Coast and N Florida.	Winters in Mexico, Caribbean Islands and Central America.	It appears that some may migrate along the coast in the fall, but fly across the Gulf in the spring.

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CY/90

Species	Breeding Habitat	Nesting Site	Breeding Range	Wintering Range	Migration Route
Louisiana Waterthrush	Most frequently breeds along gravel-bottomed streams flowing through hilly, deciduous forest. Also breeds in cypress swamps and bottomland forest along mud-bottomed streams.	Prefers to nest in small hollows in the upturned roots of fallen trees, within the bank of a stream, or under a fallen log.	Breeds primarily from SE Minnesota, W Wisconsin, S Michigan, S Ontario, N New York, central Vermont, central New Hampshire, and S Maine south to S Georgia, NW Florida, S Alabama and Mississippi, S Louisiana, and E Texas. Also west to E Oklahoma, E Kansas, and E Nebraska.	Winters from N Mexico south through Central America and Caribbean Islands.	Migrate through Southeast U.S. and Mexico with many crossing the Gulf.
Northern Parula	Primarily a riparian species; usually associate with mature forest.	Most nests are built in hanging branches of epiphytic growth, either Spanish moss or lace lichen. Preferred nesting sites are usually near water, e.g. river bottoms, sloughs, and swamps.	It has a disjunct breeding range. Breeds from extreme SE Manitoba, S-central Ontario, S Quebec, Maritime Provinces, south to NE Minnesota, N Wisconsin, N Michigan, S Ontario, throughout the Mid-Atlantic states, S Ohio, central Indiana, central Illinois, S Iowa, and E Kansas south to Gulf Coast and Florida.	Winters in Mexico, Central America, Caribbean Islands, and Florida.	Difficult to determine exact migration routes.

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CY/90

Species	Breeding Habitat	Nesting Site	Breeding Range	Wintering Range	Migration Route
White-eyed Vireo	Secondary deciduous scrub, overgrown pastures and abandoned farmland, wood margins, late- to middle-stage succession, streamside thickets; characterized as intermediate between shrubs and low trees.	Site is most often a Y-shaped horizontal deciduous branch, low to the ground. Nests are usually, but not always surrounded by dense vegetation.	Breeds from S Florida north to SE Massachusetts, west through Connecticut, extreme SE New York, Pennsylvania, extreme SW Ontario, extreme S Michigan, N. Illinois, E, Iowa, extreme SE Nebraska, E Kansas, central and E Oklahoma, and south to W-central Texas and into Mexico.	Winters from extreme SE Virginia, coastal North Carolina, E South Carolina, S Georgia, south through Florida, west to Texas and in to Mexico and Central America, and Caribbean Islands.	Some migration occurs across the Gulf of Mexico.
Yellow-throated Vireo	Breeds in a variety of edge habitats in bottomland and upland mature deciduous and mixed deciduous-coniferous forest stands. Suitable habitats include forest edges of streams, rivers, swamps, roads, and open wooded habitats with tall deciduous trees such as those found in parks, orchards, or small towns.	Typically in the upper crown of trees, most often near the center of the crown, but also out to periphery. Usually in living deciduous trees; typically large mature maple, poplar, oak, elm, hickory, beech, basswood, or other similar species.	Breeds from SE Manitoba, Extreme SW Ontario, all but NE Minnesota, N Wisconsin, the S Upper Peninsula of Michigan, SE Ontario, southernmost Quebec, all but NE Vermont, central New Hampshire and SE Maine south to central Florida the Gulf Coast of Mississippi and Alabama, S Louisiana, and SE Texas west to W-central Texas, E Oklahoma, E Kansas, E Nebraska, SE South Dakota, SW Minnesota, and NE North Dakota.	Winters from S Mexico to N South America.	Migrates across the Gulf of Mexico and sparingly across the Caribbean.

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C/190

Species	Breeding Habitat	Nesting Site	Breeding Range	Wintering Range	Migration Route
Eastern Towhee (formerly Rufous-sided Towhee)	Breeds in generalized edge habitat in varied mesic and xeric habitats characterized by dense, shrub-small tree layer. Dense low cover may be continuous or discontinuous with patches of more open ground. Overstory trees may or may not be present.	Nest placed on ground, where embedded in litter to nest rim or above ground usually to 1.5 m. Usually at the base of upright vegetation such as low shrubs, small trees, or grass and forb clumps.	Breeds from SE Manitoba, extreme NE North Dakota, NW, central and SE Minnesota, N Michigan, SE Ontario, around E Great Lakes, extreme S Quebec, NW and central Vermont, N-central New Hampshire and S Maine, south throughout midwestern and southeastern states to central Gulf states and S Florida.	Winters primarily from S New England, SE New York, SE and SW Pennsylvania, SE Ontario, N Ohio, N Indiana, N Illinois, S Iowa, and E Kansas south through E Oklahoma, and eastern third of Texas and throughout Southeast.	Birds from Northeast move southwest and south between Appalachian Mtns. And Atlantic Coast, whereas Midwest birds migrate southward or southwest and south.
Northern Cardinal			mostly eastern U.S., west to prairies, also in Southwest	Same as breeding	Not migratory.

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CY/90