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Observations of New Bird Species for San Salvador Island, The Bahamas

Michael E. Akresh and David I. King



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Cover Photograph: A selection of birds captured or sighted on San Salvador. From left to right, top row: *Vireo solitarius* (Blue-headed Vireo), *Catharus guttatus* (Hermit Thrush), *Vireo altiloquus* (Black-whiskered Vireo). Middle row: *Passerina ciris* (Painted Bunting), *Piranga rubra* (Summer Tanager), *Melospiza georgiana* (Swamp Sparrow). Bottom row: *Icteria virens* (Yellow-breasted Chat), *Charadrius melodus* (Piping Plover), *Limnothlypis swainsonii* (Swainson's Warbler). Photographs © Michael E. Akresh.

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Observations of New Bird Species for San Salvador Island, The Bahamas

Michael E. Akresh^{1,*} and David I. King²

Abstract - We present our recent observations and compile other accounts of sightings or captures of 30 additional bird species reported for San Salvador Island, The Bahamas, since Sordahl compiled his checklist in 1996. Most are Nearctic-Neotropical migratory birds that either spend the non-breeding season on the island or stop over during migration. Additionally, based on our own and others' observations, we revised the status of 19 bird species that were previously listed as "transient, vagrant, or uncertain" on the island, and 9 species listed as "rare". We captured or observed many of these species between the months of December and April 2012–2014.

Introduction

The Bahamas archipelago is known to support more than 200 bird species that occur regularly on the islands, including over 110 breeding species and 5 endemics (Currie et al. 2005a, b; McKay et al. 2010; Murphy et al. 2004; Price and Hayes 2009; White 1998). Besides resident breeders, many Nearctic-Neotropical migrants use the islands extensively during the winter, and other migratory birds pass through the islands during spring and fall migration. Given a changing climate and a high rate of development and deforestation in the Caribbean (Neelin et al. 2006, Wunderle and Waide 1993), it is important to increase our understanding of Bahamian bird distributions to improve conservation efforts for both threatened migratory and regionally endemic birds (Currie et al. 2005a).

San Salvador Island is a relatively small (163 km²) outer island on the eastern bank of The Bahamas, and its bird community has been described by a number of amateur and professional ornithologists (Bond 1956, Miller 1978, Murphy et al. 1998). Sordahl (1996) compiled a list of 153 avian species for the island from published and unpublished accounts, and categorized them by relative abundance and seasonal occurrence.

While conducting a large-scale study examining the winter ecology of *Setophaga discolor* Vieillot (Prairie Warbler) and other passerine and near-passerine birds on San Salvador, we observed many rare and new bird species for the island. Our work expanded on Sordahl's (1996) efforts and we herein update and supplement the list of birds recorded on San Salvador Island. In addition to our own data, we compiled sightings from other sources and present all accounts of known records of species not listed in Sordahl's 1996 checklist. Finally, we suggest revisions to the

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status of bird species observed that were formerly classified as “transient, vagrant, or uncertain” or “rare” on San Salvador.

Field-site Description and Methods

Sampling

Over 3 winter periods (3 January–25 March 2012, 20 December 2012–2 April 2013, and 30 December 2013–27 March 2014), we conducted extensive mist-netting (using 12-m nets) and observational bird surveys on San Salvador Island (24°02'N, 74°30'W; Fig. 1). We focused our mist-netting and surveys on 7 main plots, which contained coastal scrub habitat, human-disturbed areas, *Rhizophora mangle* L. (Red Mangrove), *Conocarpus erectus* L. (Buttonwood)-dominated habitat, short coppice (2–3 m; dense broadleaf vegetation), taller coppice (4–8 m), and coppice mixed with *Sabal palmetto* (Walter) Lodd. ex Schult. & Schult. f. (Sabal Palm) (see Jones et al. 2013 for more detailed habitat descriptions). These habitats



Figure 1. Map of San Salvador Island, The Bahamas, showing numbered areas surveyed during this study. Study plots are located in areas numbered 1–4; other areas surveyed less intensively are numbered 5–19. The Gerace Research Centre/coastal scrub (#1) area contains 4 study plots, consisting of multiple habitat types (Jones et al. 2013). The Hard Bargain Forest Trail (#8) starts at Queen’s Highway and continues west to Six Pack Pond. Map obtained from Google Earth (Google, Inc. 2014).

encompass a moisture gradient and are representative of the main habitat types found throughout San Salvador and the southern Bahamas (Currie et al. 2005b, Smith 1986). Most plots were located in the northeastern part of the island close to the Gerace Research Centre, although the taller-coppice plot (Little Lake) and Buttonwood-dominated plot (FM) were further inland (Fig. 1). Overall, we conducted over 700 person-hours of surveys and 5050 mist-net hours in all the plots combined over the 3 years.

We also conducted avian surveys outside of our plots while conducting other bird studies (Fig. 1). We conducted 10–30-min surveys at Triangle Pond and Fresh Lake, primarily at vantage points to look for waterfowl and shorebirds ~5–10 times throughout each winter. We also conducted other, more irregular avian surveys at many locations throughout the island ~1–5 times per year.

Compilation of sightings and classification

We compared species from our observations to the list formerly compiled by Sordahl (1996) to identify species previously unrecorded in San Salvador. We made identifications for our sightings and captures by referring to field guides (Raffaele et al. 1998, 2003) and photographed most of the birds sighted to confirm our observations with other ornithologists. We also supplemented our own list of new species with records from a review of all recently published accounts of the avifauna of San Salvador (Cummins et al. 2013; Hayes 2003; Murphy et al. 1998, 2001, 2004; Trimm and Hayes 2005). In addition, we examined San Salvador sightings documented by other birdwatchers on eBird and compiled all new species from the island reported on that database (Sullivan et al. 2009). We assumed that all eBird sightings were correctly identified to species because these reports were from very experienced birders. Lastly, we obtained reports of unpublished sightings from experienced birders Kenneth and Nancy Andersen, who conducted surveys on the island between 1985 and 2009 (K. Andersen, Gannon University, Erie, PA, USA, unpubl. data).

We classified the relative abundance and status of all new species and reclassified those that were recently observed but previously listed as transient, vagrant, or uncertain. We also noted particular species originally listed as rare in Sordahl's (1996) list for which we proposed a revised abundance classification. We followed Raffaele et al.'s (2003) classification system, which is similar to the classifications used by Sordahl (1996). Specifically, a species' status was classified as: (1) year-round resident—spends its entire life cycle on the island, (2) summer breeding resident—migrates off the island during the non-breeding season, (3) non-breeding resident—spends part or all of the temperate-zone winter on the island, (4) transient—stops over on the island during migration (also known as a passage migrant), or (5) species status uncertain. We assigned classifications based on information regarding a species' status on other Bahamian islands or in the Caribbean (Raffaele et al. 2003, White 1998) as well as on distributions and sightings on eBird (Sullivan et al. 2009). We also took into account the dates of our own or others' observations or captures on the island. We examined fat levels of the birds we captured to help determine migratory status because transient species en route during migration often have more fat than non-breeding residents (Jenni and Jenni-Eiermann 1998).

We described the relative abundance of each species based on our own observations, as well as those from the literature, eBird sightings, and other reports throughout the West Indies (Raffaele et al. 2003, Sullivan et al. 2009, White 1998). Species in prime habitat (assuming an observer was surveying the best habitat on the island for a given species, during the correct season) were classified as: (1) common—likely to be seen daily; (2) uncommon—not likely to be seen daily, but seen at least twice per year; (3) rare—observed fewer than 2 times per year on the island; and (4) vagrant—observed at most once in every 10 years (Raffaele et al. 2003, White 1998).

Results and Discussion

In total, we documented 30 species new to San Salvador Island, 14 of which were from our field observations between 2012 and 2014 (Table 1). The remaining species were included in reports by K. and N. Andersen (pers. observ.), M.T. Murphy (Murphy et al. 2001), W.K. Hayes (2003), and K. Peiman, B. Carnes, and other birders (Sullivan et al. 2009). This compilation represents a 20% increase in the known avifauna observed on the island as reported by Sordahl (1996), who listed 153 species. Based on our own and others' observations, we revised the status of 19 bird species that were previously deemed as transient, vagrant, or uncertain (Table 2), and 9 species that were previously considered rare (Table 3).

Nearctic-Neotropical migratory birds not known to breed in the Caribbean comprised the majority of these new records, a number of which were non-breeding residents that spent part or all of the temperate winter on the island. For many species that we classified as non-breeding residents, such as *Chen caerulescens* (Snow Goose), *Charadrius melodus* (Piping Plover), *Turdus migratorius* (American Robin), and others (Table 1), previous literature has cited these species as non-breeding residents elsewhere in The Bahamas and the Caribbean (Raffaele et al. 2003, White 1998), and we observed some of these species in January and February. Other rare species that we believe were non-breeding residents were *Leiothlypis ruficapilla* (Wilson) (Nashville Warbler), *Limnothlypis swainsonii* (Swainson's Warbler), and *Icteria virens* (Yellow-breasted Chat); we captured individuals of these species with little fat in January and February.

In addition to non-breeding residents, we compiled accounts of birds using the island as a stopover site during migration. Species encountered primarily during the fall and spring migration, mostly by other birders, included *Vireo olivaceus* (Red-eyed Vireo), *Setophagia striata* (Blackpoll Warbler), *Protonotaria citrea* (Prothonotary Warbler), and *Dolichonyx oryzivorus* (Bobolink) (Tables 1, 2). These are species that have known core, non-breeding distributions south of The Bahamas, and other literature also considers them as transient species (Raffaele et al. 2003, White 1998). We captured only 1 of the above 4 species: a Red-eyed Vireo in late March with a large fat load.

Lastly, some migratory species that were represented by a single encounter and had not been formerly reported for the region may have been vagrants. For

Table 1. Avian species documented for San Salvador Island, The Bahamas, that were not included in Sordahl's (1996) checklist. Year seen was omitted if unknown. Total number of known individuals observed was tallied based on our own sightings, eBird reports, other publications, and Andersen's unpublished data. We noted if we have or know of a photograph (pic) taken of at least one individual of the species on the island. See Jones et al. (2013) for descriptions of habitat types. Relative abundance: common (c), uncommon (u), rare (r); Status: vagrant (V), year-round resident (R), summer breeding resident (S), non-breeding winter resident (W), transient (T), or uncertain (U).

Species	Study	Year Seen	Total #	Habitat type	Status
<i>Pelecanus erythrorhynchos</i> Gmelin (American White Pelican)	eBird	2013	2		V
<i>Sula dactylatra</i> Lesson (Masked Booby)	Hayes 2003	1998	2		rU
<i>Phalacrocorax brasilianus</i> (Gmelin) (Neotropic Cormorant)	eBird	2013	3 (pic)		rU
<i>Eudocimus albus</i> (L.) (White Ibis)	This study	2012, 2014	4 (pic)	Wetlands/pond	rW
<i>Chen caerulescens</i> (L.) (Snow Goose)	This study	2013	9	Wetlands/pond	rW
<i>Anas acuta</i> L. (Northern Pintail)	eBird	2013	4	Wetlands/pond	rW
<i>Accipiter striatus</i> Vieillot (Sharp-shinned Hawk)	This study	2013	2	Sabal palms/coppice	rW
<i>Charadrius melodus</i> (Ord) (Piping Plover)	This study, eBird	2012, 2013, 2014	5 (pic)	Shore	rW
<i>Phalaropus tricolor</i> (Vieillot) (Wilson's Phalarope)	eBird	1988	1		V
<i>Chroicocephalus ridibundus</i> L. (Black-headed Gull)	Andersen	1988	1		V
<i>Larus fuscus</i> L. (Lesser Black-backed Gull)	This study	2013	1	Flyover	rW
<i>Sterna hirundo</i> L. (Common Tern)	Andersen	1987, 1989	15		rT
<i>Gygis alba</i> (Sparman) (White Tern)	eBird	2010	1 (pic)		V
<i>Anstrostramus vociferus</i> (Wilson) (Eastern Whip-poor-will)	eBird	2013	1	Disturbed	V
<i>Catharus guttatus</i> (Pallas) (Hermit Thrush)	This study	2014	1 (pic)	Disturbed	rT
<i>Vireo bellii</i> Audubon (Bell's Vireo)	This study	2012	1 (pic)	Disturbed	V
<i>Vireo solitarius</i> (Wilson) (Blue-headed Vireo)	eBird, This study	1988, 2014	2 (pic)	Disturbed	rT
<i>Vireo altiloquus</i> (Vieillot) (Black-whiskered Vireo)	eBird, this study	1983, 2012, 2014	7 (pic)	Coastal scrub, disturbed	uU
<i>Progne subis</i> (L.) (Purple Martin)	Andersen	1989	2		rT
<i>Protonotaria citrea</i> (Boddaert) (Prothonotary Warbler)	eBird, Murphy et al. 2001	1982, 2012	3		rT
<i>Limnothlypis swainsonii</i> (Audubon) (Swainson's Warbler)	Murphy et al. 2001, This study	2012, 2014	4 (pic)	Coastal scrub, coppice	rW
<i>Cardellina pusilla</i> (Wilson) (Wilson's Warbler)	Andersen	2009	1		rT
<i>Cardellina canadensis</i> (L.) (Canada Warbler)	Andersen	2009	1		rT
<i>Icteria virens</i> (L.) (Yellow-breasted Chat)	Murphy et al. 2001, This study	2012	2 (pic)	Coastal scrub	rW
<i>Spindalis zena</i> (L.) (Western Spindalis)	This study	2013	2 (pic)	Coppice	rU
<i>Spizella pallida</i> (Swainson) (Clay-colored Sparrow)	eBird	2011	1 (pic)		V

Table 1, continued.

Species	Study	Year Seen	Total #	Habitat type	Status
<i>Melospiza georgiana</i> (Latham) (Swamp Sparrow)	This study	2013	1 (pic)	Mangroves	V
<i>Piranga rubra</i> (L.) (Summer Tanager)	eBird	2012, 2013	2 (pic)		rW
<i>Passerina ciris</i> (L.) (Painted Bunting)	Murphy et al. 2001, This study	2013, 2014	28 (pic)	Many habitats	uW
<i>Icterus galbula</i> (L.) (Baltimore Oriole)	eBird	1988	1		rW

Table 2. Avian species observed on San Salvador Island listed as transient, vagrant, or uncertain species in Sordahl's (1996) checklist, along with a suggested reclassification (status: c = common, u = uncommon, r = rare, S = summer breeding resident, T = transient, W = non-breeding winter resident, and U = uncertain). We noted if we have or know of a photograph (pic) taken of at least one individual of the species on the island.

Species	Study	Year seen	Total #	Habitat type	Status
<i>Puffinus lherminieri</i> Lesson (Audubon's Shearwater)	Trimm and Hayes 2005, eBird	2000–2003, 2012, 2013	374 (pic)		cS
<i>Nycticorax nycticorax</i> (L.) (Black-crowned Night-Heron)	Andersen	1987, 2008	4		rU
<i>Porphyrio martinica</i> (L.) (Purple Gallinule)	Andersen	1991	1		rW
<i>Recurvirostra americana</i> Gmelin (American Avocet)	eBird	2007, 2013	3 (pic)	Wetlands/pond	rW
<i>Gallinago delicata</i> (Ord) (Wilson's Snipe)	Andersen, This study	1986, 2013, 2014	6	Wetlands/pond	uW
<i>Zenaidura asiatica</i> (L.) (White-winged Dove)	This study, eBird, Cummins et al. 2013	2012	3 (pic)	Coppice, disturbed	uU
<i>Coccyzus americanus</i> (L.) (Yellow-billed Cuckoo)	eBird	2012	1		rT
<i>Sphyrapicus varius</i> (L.) (Yellow-bellied Sapsucker)	This study	2013, 2014	33 (pic)	Many habitats	uW
<i>Vireo olivaceus</i> (L.) (Red-eyed Vireo)	This study	2013	1 (pic)	Coastal scrub	rT
<i>Tachycineta bicolor</i> (Vieillot) (Tree Swallow)	eBird	1982, 2012	19		rT
<i>Riparia riparia</i> (L.) (Bank Swallow)	eBird	1983	1		rT
<i>Turdus migratorius</i> L. (American Robin)	This study	2014	2	Disturbed	rW
<i>Bombycilla cedrorum</i> Vieillot (Cedar Waxwing)	This study	2014	25	Disturbed, coastal scrub	rW
<i>Oreothypis ruficapilla</i> Wilson (Nashville Warbler)	This study	2012, 2013	4 (pic)	Disturbed, coastal scrub	rW
<i>Setophaga fusca</i> (Müller) (Blackburnian Warbler)	Andersen, This study	2008, 2012	3	Sabal palms/coppice	rT
<i>Setophaga striata</i> Forster (Blackpoll Warbler)	Andersen, eBird	2008, 2012	8 (pic)		uT
<i>Pheniculus ludovicianus</i> L. (Rose-breasted Grosbeak)	This study	2012, 2013	2	Disturbed, coastal scrub	rW
<i>Dolichonyx oryzivorus</i> (L.) (Bobolink)	eBird	2011, 2012	3		rT
<i>Molothrus ater</i> (Boddaert) (Brown-headed Cowbird)	This study	2013	2 (pic)	Disturbed	rT

example, before this study, *Vireo bellii* (Bell's Vireo) had never been reported on eBird previously in the Caribbean, and *Melospiza georgiana* (Swamp Sparrow) had never been reported on eBird in the southern Bahamas (Sullivan et al. 2009); we captured both of these species. We classified *Molothrus ater* (Brown-headed Cowbird), *Vireo solitarius* (Blue-headed Vireo), and *Catharus guttatus* (Hermit Thrush) as transients (White 1998). The latter 2 species were captured and had some fat, but these species were all somewhat outside of their usual range and could alternatively have been vagrant birds.

The remainder of new species we observed are resident breeders elsewhere in The Bahamas and could be resident breeders on the island. However, we do not have reliable breeding confirmation for these species, which we therefore classified as uncertain status: *Sula dactylatra* (Masked Booby), *Phalacrocorax brasilianus* (Neotropic Cormorant), and *Nycticorax nycticorax* (Black-crowned Night-Heron) observed by other birders, and *Spindalis zena* (Western Spindalis), *Vireo altiloquus* (Black-whiskered Vireo), and *Zenaida asiatica* (White-winged Dove), observed by us during this study (Hayes 2003, Raffaele et al. 2003). Specifically, we observed 2 male Western Spindalis along Jake Jones' road and a bulldozed trail just south of Jake Jones' road in 2013. We saw 1 bird on 3 February 2013 and it stayed in the same general area until we last sighted it on 30 March 2013. The other male was also observed on 30 March 2013 and was seen again in the same location on 1 April 2013, approximately 1250 m away from the first male. However, we did not document any Western Spindalis in 2014, despite playback surveys in the northwest part of the island and in areas where we sighted the birds in 2013, suggesting that the males we observed were transients. We captured Black-whiskered Vireos mostly in March. These birds might have been using the island as a stopover site during migration. However, a different observer recorded 2 Black-whiskered Vireos on the island during the species' breeding season in May (Raffaele et al. 1998, Sullivan et al. 2009); thus, there is a possibility that this species is breeding on San Salvador. Two of the 5 Black-whiskered Vireos we captured had large fat loads, whereas the other 3 had little to no fat. Future surveys during the summer breeding season would be useful to determine the breeding status of these species on the island.

Table 3. Reclassification of avian species listed as rare species in Sordahl's (1996) checklist. Relative abundance: common (c), uncommon (u); Status: year-round resident (R) or non-breeding winter resident (W).

Species	Revised status
<i>Porzana carolina</i> (L.) (Sora)	cW
<i>Geotrygon chrysis</i> Bonaparte (Key West Quail-Dove)	u-cR
<i>Melanerpes superciliosus</i> (Temminck) (West Indian Woodpecker)	uR
<i>Dumetella carolinensis</i> (L.) (Gray Catbird)	cW
<i>Vireo griseus</i> (Boddaert) (White-eyed Vireo)	u-cW
<i>Setophaga caeruleascens</i> (Gmelin) (Black-throated Blue Warbler)	u-cW
<i>Setophaga coronata</i> (L.) (Yellow-rumped Warbler)	uW
<i>Seiurus aurocapilla</i> (L.) (Ovenbird)	u-cW
<i>Geothlypis trichas</i> (L.) (Common Yellowthroat)	u-cW

Our observations suggest that some of the designations of species as transient, vagrant, uncertain, or rare are in need of revision. For 9 species that Sordahl (1996) listed as rare, we propose instead an uncommon or common status (Table 3). We observed or captured these species on most days when we were in the species' prime habitat. For instance, we captured >100 *Dumetella carolinensis* (Gray Catbirds) and >50 *Setophaga caerulescens* (Black-throated Blue Warblers) in 2014. Murphy et al. (1998) also noted some of these misclassifications because they too had relatively high captures of some of these 9 species we propose for status changes. Other relatively more common, non-breeding resident species that Sordahl (1996) did not classify include *Gallinago delicata* (Wilson's Snipe), *Sphyrapicus varius* (Yellow-bellied Sapsucker), and *Passerina ciris* (Painted Bunting) (Tables 1, 2).

The 30 new species probably represent a combination of many species that have been present on San Salvador and overlooked or not reported, and a few species that have extended their ranges because of changes in population size and/or environmental conditions. Our study is one of the most complete and in-depth bird surveys on San Salvador, both in terms of observer effort and geographic scope. Thus, it is not surprising that we encountered species that were not observed in shorter-term studies with more limited coverage. For example, we encountered many *Setophaga kirtlandii* (Baird) (Kirtland's Warblers; Jones et al. 2013), a species that had not been seen on the island for over 46 years despite the previous work by ornithologists, birders, and student groups visiting the research center on the island (Miller 1978, Murphy et al. 2001). We speculate the increased number of detections of this species could be, at least in part, a result of an increase in its global population. Likewise, some of the new species observed may be more detectible or may be exhibiting range expansions due to population increases or other factors. However, we find it unlikely that the majority of new species we observed immigrated to San Salvador in the last 20 years. We recommend continued surveys on San Salvador as well as throughout the rest of the Bahamian archipelago and the Caribbean to increase our knowledge of bird distributions in the region, and thus facilitate the conservation of endangered or declining migratory and resident birds (Wunderle and Waide 1993, Wunderle et al. 2010).

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Literature Cited

- Bond, J. 1956. Check-list of Birds of the West Indies, 4th Edition. The Academy of Natural Sciences of Philadelphia, Philadelphia, PA, USA. 214 pp.
- Cummins, R.H., M.R. Boardman, and M.L. McPhail. 2013. Birds of San Salvador, Bahamas: A Photo Essay of Common Birds. Environmental Education and Sustainability, LLC, Oxford, OH, USA. 132 pp.
- Currie, D., J.M. Wunderle, Jr., D.N. Ewert, M.R. Anderson, A. Davis, and J. Turner. 2005a. Habitat distribution of birds wintering in Central Andros, The Bahamas: Implications for management. *Caribbean Journal of Science* 41:75–87.
- Currie, D., J.M. Wunderle, Jr., D.N. Ewert, A. Davis, and Z. McKenzie. 2005b. Winter avian distribution and relative abundance in six terrestrial habitats on southern Eleuthera, The Bahamas. *Caribbean Journal of Science* 41:88–100.
- Google, Inc. 2014. Google Earth. Mountain View, CA. Available online at <http://www.earth.google.com/>. Accessed 1 June 2014.
- Hayes, W.K. 2003. Can San Salvador's iguanas and seabirds be saved? *Bahamas Journal of Science* 11:2–8.
- Jenni, L., and S. Jenni-Eiermann. 1998. Fuel supply and metabolic constraints in migrating birds. *Journal of Avian Biology* 29:521–528.
- Jones, T.M., M.E. Akresh, and D.I. King. 2013. Recent sightings of Kirtland's Warblers on San Salvador Island, The Bahamas. *Wilson Journal of Ornithology* 125:637–642.
- McKay, B.D., M.B.J. Reynolds, W.K. Hayes, and D.S. Lee. 2010. Evidence for the species status of the Bahama Yellow-throated Warbler (*Dendroica "dominica" flavescens*). *Auk* 127:932–939.
- Miller, R.J. 1978. Notes on birds of San Salvador Island (Watlings), the Bahamas. *Auk* 95:281–287.
- Murphy, M.T., K.L. Cornell, and K.L. Murphy. 1998. Winter bird communities on San Salvador, Bahamas. *Journal of Field Ornithology* 69:402–414.
- Murphy, M.T., A. Pierce, J. Shoen, K.L. Murphy, J.A. Campbell, and D.A. Hamilton. 2001. Population structure and habitat use by overwintering neotropical migrants on a remote oceanic island. *Biological Conservation* 102:333–345.
- Murphy, M.T., J. Zysik, and A. Pierce. 2004. Biogeography of the birds of the Bahamas with special reference to the island of San Salvador. *Journal of Field Ornithology* 75:18–30.
- Neelin, J.D., M. Munnich, H. Su, J.E. Meyerson, and C.E. Holloway. 2006. Tropical drying trends in global-warming models and observations. *Proceedings of the National Academy of Sciences of the United States of America* 103:6110–6115.
- Price, M.R., and W.K. Hayes. 2009. Conservation taxonomy of the Greater Antillean Oriole (*Icterus dominicensis*): Diagnosable plumage variation among allopatric populations supports species status. *Journal of Caribbean Ornithology* 22:19–25.
- Raffaele, H., J. Wiley, O. Garrido, A. Keith, and J. Raffaele. 1998. *A Guide to the Birds of the West Indies*. Princeton University Press, Princeton, NJ, USA. 216 pp.
- Raffaele, H., J. Wiley, O. Garrido, A. Keith, and J. Raffaele. 2003. *Birds of the West Indies*. Princeton University Press, Princeton, NJ, USA. 511 pp.

- Smith, R.R. 1986. Major plant communities on San Salvador Island, The Bahamas. Pp. 36–49, *In* R.R. Smith (Ed.). Proceedings of the First Symposium on the Botany of the Bahamas. Bahamian Field Station, Ltd., San Salvador, Bahamas.
- Sordahl, T.A. 1996. A checklist of the birds of San Salvador Island, Bahamas. Pp. 144–151, *In* N.B. Elliott, D.C. Edwards, and P.J. Godfrey (Eds.). Proceedings of the 6th Symposium of the Natural History of the Bahamas. Bahamian Field Station, Ltd., San Salvador, Bahamas.
- Sullivan, B.L., C.L. Wood, M.J. Iliff, R.E. Bonney, D. Fink, and S. Kelling. 2009. eBird: A citizen-based bird-observation network in the biological sciences. *Biological Conservation* 142:2282–2292.
- Trimm, N.A., Jr., and W.K. Hayes. 2005. Distribution of nesting Audubon’s Shearwaters (*Puffinus lherminieri*) on San Salvador Island, Bahamas. Pp. 137–145, *In* S.D. Buckner and T.A. McGrath (Eds.). Proceedings of the 10th Symposium on the Natural History of the Bahamas. Gerace Research Center, Ltd., San Salvador, Bahamas.
- White, A.W. 1998. *A Birder’s Guide to The Bahama Islands (including Turks and Caicos)*. American Birding Association, Colorado Springs, CO, USA. 302 pp.
- Wunderle, J.M., Jr., and R.B. Waide. 1993. Distribution of overwintering Nearctic migrants in the Bahamas and Greater Antilles. *Condor* 95:904–933.
- Wunderle, J.M., Jr., D. Currie, E.H. Helmer, D.N. Ewert, J.D. White, T.S. Ruzycki, B. Parresol, and C. Kwit. 2010. Kirtland’s warblers in anthropogenically disturbed early-successional habitats on Eleuthera, The Bahamas. *Condor* 112:123–137.