Atlantic Flyway Disturbance Project

- Literature Review
  Version II: Key Terms
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The goal of this literature review was to compile information on the impacts of human disturbances to shorebird, their habitats, their prey, and information on management recommendations for reducing human disturbances to shorebirds. We focused on human disturbance to breeding, migrating, and wintering shorebirds along the Atlantic Flyway. For topics where there was limited research along the Atlantic Flyway, we also included pertinent information from other areas around the world. Similarly, for topics where there was minimal research related to shorebirds, we included information related to non-shorebird, coastal species.

We conducted the literature review in 2017-2018. We started by searching for articles related to the Atlantic Flyway Shorebird Initiative’s fifteen focal species and top ranked human disturbances (Mengak and Dayer, 2018) throughout online databases such as JSTOR, Science Direct, Google Scholar, Research Gate, and Springer Link. To ensure a complete and thorough search, backwards and forward reference searching was implemented to verify that the review was complete. As the literature was compiled from various sources, it was reviewed, organized, and tagged in a Mendeley database. Tags are key terms or text labels that are used to identify the contents of an article and group articles of similar topics. We tagged articles based on their study location, the focal species of the study, the season in which the research was conducted, the migration status of the focal species (i.e. migrant or non-migrant), the breeding status of the focal species (i.e. breeding or non-breeding), the study foci (i.e. the main themes of the study such as education, abundance, signage, nest-site selection, etc.), and disturbance types (i.e. walking, driving, boating, etc.).

The literature review contains 632 citations that are organized into two documents: Version I contains a list of the citations in alphabetical order, and Version II contains the citations organized by key terms/tags. Although these lists are current as of 2017, the documents should continue to be updated as new information on human disturbance is revealed.
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Impacts and Recommendations

Management recommendation


Massachusetts Division of Fisheries and Wildlife. (2016). Massachusetts division of fisheries and wildlife (DFW) habitat conservation plan for piping plover.


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Stillman, R. A., West, A. D., Clarke, R. T., & Liley, D. (2012). *Solent disturbance and mitigation project phase II: Predicting the impact of human disturbance on overwintering birds in the Solent.*


van Polanen Petel, T., & Bunce, A. (2008). *Feathering the future of Burnett Mary shorebirds*.


**Impact on shorebirds**


21


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**Impact on habitat**


Massachusetts Division of Fisheries and Wildlife. (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts.*


Walsh, W., & Scherer, A. (2002). *Biological opinion on the effects of completion of sections I and II of the Atlantic Coast of New Jersey beach erosion control project Sea Bright to Manasquan, Monmouth County, New Jersey on the Piping Plover (Charadrius melodus) and Seabeach Amaranth (Am.


**Impact on prey**


**Location**

**Africa**


**Alabama**

Alaska


Arizona


Asia


Atlantic Coast


**Australia**


van Polanen Petel, T., & Bunce, A. (2008). *Feathering the future of Burnett Mary shorebirds*.


**California**


**Canada**


**Colorado**


**Delaware Bay**


**Europe**


Florida


**Georgia**


**Gulf of Mexico**


**Hawaii**


**Idaho**


**Louisiana**


**Maine**


**Maryland**


Massachusetts


Massachusetts Division of Fisheries and Wildlife. (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts.*

Massachusetts Division of Fisheries and Wildlife. (2016). *Massachusetts division of fisheries and wildlife (DFW) habitat conservation plan for piping plover.*


Mexico


Michigan

Mid Atlantic


Mississippi


Nebraska


Netherlands


New Jersey


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Walsh, W., & Scherer, A. (2002). Biological opinion on the effects of completion of sections I and II of the Atlantic Coast of New Jersey beach erosion control project Sea Bright to Manasquan, Monmouth County, New Jersey on the Piping Plover (Charadrius melodus) and Seabeach Amaranth (Am. Retrieved from https://www.fws.gov/northeast/endangered/TEBO/PDFs/Monmouth County Programmatic BO.pdf


New York


**New Zealand**


81
North America


North Carolina


**North Dakota**


**Ohio**


**Oregon**


**Pennsylvania**

Philadelphia


Portugal


Rhode Island


Scotland


South America


**South Carolina**


**South Dakota**


**Texas**


UK


USA


**Virginia**


95


Wisconsin


Species

African Black Oystercatcher


**American Golden Plover**


**American Oystercatcher**


**Arctic Tern**

Massachusetts Division of Fisheries and Wildlife (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts*.

**Australia Pied Oystercatcher**


**Black Guillemot**


**Black Oystercatcher**


**Black Skimmer**


**Black-bellied Plover**


**Black-tailed Godwit**


**Brown Pelican**


Cassin’s Auklet

Common Tern


Massachusetts Division of Fisheries and Wildlife (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts.*

Cormorant

Crested Tern

Curlew


Dotterel


Double Crested Cormorant


Dunlin


**Eastern Curlew**


**Egret**


Eskimo Curlew


European Oystercatcher


Eurasian Curlew


Eurasian Oystercatcher


Far Eastern Curlew


Geese


**Godwit**


**Golden Plover**


**Greater Yellowlegs**


**Greenshank**


**Gull**


**Gull-billed Tern**


**Heron**


**Hooded Plover**


Kentish Plover


Killdeer


Kittiwake


Lapwing


Least Tern


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Massachusetts Division of Fisheries and Wildlife. (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts*.


**Little Tern**


**Marbled Godwit**


**Piping Plover**


Massachusetts Division of Fisheries and Wildlife. (2016). Massachusetts division of fisheries and wildlife (DFW) habitat conservation plan for piping plover.


Vale, K. M. (2016). *Investigation of factors influencing piping plover distribution along the Upper Texas Coast.* University of Houston. Retrieved from https://media-proquest-com.ezproxy.lib.vt.edu/media/pq/classic/doc/4113534591/fmt/ai/rep/SPDF?cit%3Aauth=Vale%2C+Kristen+M.&cit%3Atitle=%3CTitleAtt+RawLang%3D%22English%22+HTMLContent%3D%22true%22%3EInvestigation+of+factors+influencing+piping+plover+distribution+along+the+Upper+Texas+Coast.&cit%3Apub=ProQuest+Dissertations+and+Theses

Walsh, W., & Scherer, A. (2002). *Biological opinion on the effects of completion of sections I and II of the Atlantic Coast of New Jersey beach erosion control project Sea Bright to Manasquan, Monmouth County, New Jersey on the Piping Plover (Charadrius melodus) and Seabeach Amaranth (Amaranthaceae).* Retrieved from https://www.fws.gov/northeast/endangered/TEBO/PDFs/Monmouth_County_Programmatic_BO.pdf


**Red Knot**


**Red-capped Plover**


**Ringed Plover**


**Roseate Tern**

Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore*. State University of New York.


Massachusetts Division of Fisheries and Wildlife. (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts*


**Ruddy Turnstone**


Sanderling


Durkin, M. M. (2016). *Impacts of anthropogenic disturbance on breeding snowy plovers (Charadrius nivosus) in the Florida panhandle.* Retrieved from https://media-proquest-com.ezproxy.lib.vt.edu/media/pq/classic/doc/4319542931/fmt/ai/rep/NPDF?cit%3Aauth=Durkin%2C+Maureen+Madden&cit%3Atitle=%3CTitleAtt+RawLang%3D%22English%22+HTMLContent%3D%22true%22%3EImpacts+of+...&cit%3Apub=ProQuest+Dissertations+an


**Sandpiper**


**Semipalmated Plover**


125
Semipalmated Sandpiper


Short-billed Dowitcher


**Snowy Egret**


**Snowy Plover**


**Stone Curlew**


**Whimbrel**


**Willet**


**Wilson’s Plover**


**Seasons**

**Fall**


van Polanen Petel, T., & Bunce, A. (2008). *Feathering the future of Burnett Mary shorebirds*.


Spring


van Polanen Petel, T., & Bunce, A. (2008). *Feathering the future of Burnett Mary shorebirds*.


**Summer**


Winter


Stillman, R. A., West, A. D., Clarke, R. T., & Liley, D. (2012). *Solent disturbance and mitigation project phase II: Predicting the impact of human disturbance on overwintering birds in the Solent.*


van Polanen Petel, T., & Bunce, A. (2008). *Feathering the future of Burnett Mary shorebirds*.


**Migration Status**

*Migrant*


Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore*. State University of New York.


Durkin, M. M. (2016). *Impacts of anthropogenic disturbance on breeding snowy plovers (Charadrius nivosus) in the Florida panhandle.* Retrieved from https://media-proquest-com.ezproxy.lib.vt.edu/media/pq/classic/doc/4319542931/fmt/ai/rep/NPDF?cit%3Aauth=Durkin%2C+Maureen+Madden&cit%3Atitle=%3CTitleAtt+RawLang%3D%22English%22+HTMLContent%3D%22true%22%Elt%3C+of+&cit%3Apub=ProQuest+Dissertations+&an


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Massachusetts Division of Fisheries and Wildlife. (2016). *Massachusetts division of fisheries and wildlife (DFW) habitat conservation plan for piping plover.*


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van Polanen Petel, T., & Bunce, A. (2008). *Feathering the future of Burnett Mary shorebirds*.


Walsh, W., & Scherer, A. (2002). Biological opinion on the effects of completion of sections I and II of the Atlantic Coast of New Jersey beach erosion control project Sea Bright to Manasquan, Monmouth County, New Jersey on the Piping Plover (Charadrius melodus) and Seabeach Amaranth (Am. Retrieved from https://www.fws.gov/northeast/endangered/TEBO/PDFs/Monmouth County Programmatic BO.pdf


Non-migrant


Breeding Status

Breeding


Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore*. State University of New York.


Massachusetts Division of Fisheries and Wildlife. (2016). *Massachusetts division of fisheries and wildlife (DFW) habitat conservation plan for piping plover.*


**Non-breeding**


Stillman, R. A., West, A. D., Clarke, R. T., & Liley, D. (2012). *Solent disturbance and mitigation project phase II: Predicting the impact of human disturbance on overwintering birds in the Solent*.


**Study Foci**

**Abundance**


**Beach Closure**


**Behavioral response**

Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore*. State University of New York.


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**Buffer**

Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore.* State University of New York.


**Coastal engineering**


206


**Community based conservation**


**Community based social marketing**


**Distribution**


Disturbance


Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougallii) in the Cape Cod National Seashore*. State University of New York.


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Fournet, B. (2015). *Determining impacts on least tern (Sternula antillarum) breeding colonies along a gradient of human disturbance.* College of Charleston. Retrieved from https://media-proquest-com.ezproxy.lib.vt.edu/media/pq/classic/doc/3898904871/fmt/ai/rep/NPDF?cit%3Aauth=Fournet%2CBrittany&cit%3ATitle=Determining+impacts+on+least+tern+%28%26lt%3BSternula+antillarum+%26gt%3B%26%3B%26lt%3BSternula+antillarum+...&cit%3Apub=ProQuest+Dissertations+and+The


Massachusetts Department of Fisheries and Wildlife. (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts.*

Massachusetts Division of Fisheries and Wildlife. (2016). *Massachusetts division of fisheries and wildlife (DFW) habitat conservation plan for piping plover.*


Stillman, R. A., West, A. D., Clarke, R. T., & Liley, D. (2012). *Solent disturbance and mitigation project phase II: Predicting the impact of human disturbance on overwintering birds in the Solent.*


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Ecotourism


**Education**


Fisheries


Foraging rates


**Habitat alteration**


Walsh, W., & Scherer, A. (2002). *Biological opinion on the effects of completion of sections I and II of the Atlantic Coast of New Jersey beach erosion control project Sea Bright to Manasquan, Monmouth County, New Jersey on the Piping Plover (Charadrius melodus) and Seabeach Amaranth (Am.* Retrieved from https://www.fws.gov/northeast/endangered/TEBO/PDFs/Monmouth County Programmatic BO.pdf


**Habituation**


**Horseshoe crab harvest**


**Human wildlife conflict**


264


Increase awareness


265


Leashes


Mortality


**Nest**


**Nest-site selection**


**Public perception**


**Recreation**


Stillman, R. A., West, A. D., Clarke, R. T., & Liley, D. (2012). *Solent disturbance and mitigation project phase II: Predicting the impact of human disturbance on overwintering birds in the Solent.*


**Reproductive success**


300


308


Risk evaluation


Ravenscroft, N. (2012). *A simple method for assessing the risk of disturbance to birds at coastal sites*.


Roost disturbance


the importance of undisturbed roosting sites for waterbird conservation. *Journal of Coastal Conservation, 16*(3), 373–381. https://doi.org/10.1007/s11852-012-0208-1


**Setback distance**


313


**Signage**


Social science


**Staging area**

Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore*. State University of New York.


**Stakeholder perception**


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Urban beaches


**Disturbance Types**

**Bike riding**


**Coastal engineering**


**Commercial fishing**


**Direct harassment**


Dog


**Driving**


**Event**


**General beachgoing**


Durkin, M. M. (2016). *Impacts of anthropogenic disturbance on breeding snowy plovers (Charadrius nivosus) in the Florida panhandle.* Retrieved from https://media-proquest-com.ezproxy.lib.vt.edu/media/pq/classic/doc/4319542931/fmt/ai/rep/NPDF?cit%3Aauth=Durkin%20C+Maureen+Madden&cit%3Atitle=%23CTitleAtt+RawLang%3D%22English%22+HTMLContent%3D%22true%22%3EImpacts+of+...&cit%3Apub=ProQuest+Dissertations+an


Massachusetts Division of Fisheries and Wildlife. (1993). *Guidelines for managing recreational use of beaches to protect piping plovers, terns, and their habitats in Massachusetts.*


Manned aircraft


**Non-motorized watersport**


**Pedestrian**


Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougallii) in the Cape Cod National Seashore.* State University of New York.


**Raking**


**Recreational fishing**


Watercraft


**Wildlife feeding**


**Wildlife research**

Althouse, M. A. (2016). *Behavioral and demographic effects of anthropogenic disturbance to staging roseate terns (Sterna dougalli) in the Cape Cod National Seashore*. State University of New York.


**Wind-powered aircraft**