Osprey Nation 2023 Season Report

November 15th, 2023

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Cover Photo

Two Osprey chicks from Stratford #8 / Stratford Long Beach. Photo by Lisa Jarosik

The Connecticut Audubon Society Mission

The Connecticut Audubon Society protects Connecticut's birds, other wildlife, and their habitats through conservation, education, and advocacy.

Acknowledgements

The continued success of Osprey Nation is due to the efforts of so many involved. Thank you to Milan Bull, Tom Andersen, Joyce Leiz and other members of the team at Connecticut Audubon for your guidance throughout the season. Thank you to Bre Ellis, the 2022 Osprey Nation coordinator, for her early-season instruction and continued help and assistance. Thank you to Brian Hess of the Connecticut Department of Energy and Environmental Protection for his support of the project. Thank you also to our many rehabbers and volunteers around the state who provided care to injured Osprey, created safe nesting opportunities, and removed trash and fishing line at nest sites. Thank you to the stewards both new and returning who have helped collect the data that shaped the 2023 season. Without your dedication, knowledge of Connecticut's Osprey population would be limited. A complete list of 2023 stewards can be found in Appendix A.

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INTRODUCTION

Osprey Nation is a statewide citizen science effort aimed at monitoring the size, productivity, and health of Connecticut's Osprey population. Since 2014, the project's volunteers or "stewards" have worked throughout the breeding season to record information about nest sites around the state. This season, a record number of stewards collected data at a record number of nests.

In early spring, when Ospreys are returning to the breeding grounds in Connecticut, stewards document pair formation, mating, and incubation behavior. As the season progresses, hatch date, hatchling count, and eventually fledgling count are recorded at each nest.

This season, stewards recorded a record number of active Osprey nests and fledglings; however, productivity (fledglings per active nest) was lower than in years past (Table 1).

Table 1. Seasonal monitoring effort and breeding data collected by Osprey Nation (2014 - 2023). An * denotes estimated values during the Covid-19 Pandemic.

	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Stewards	100	146	224	287	314	342	231	342	385	411
Nests with data	174	322	420	540	603	732	733	814	827	943
Active Nests	210	250	337	394	416	501	510	558	606	688
Fledglings	N/A	356	490	607	725	650	549/ 744*	858	835	881
Fledglings per nest	N/A	1.42	1.45	1.54	1.74	1.3	1.08/ 1.46*	1.54	1.37	1.28

PROJECT HISTORY

Due to the retirement of the Connecticut Department of Energy and Environmental Protection's (DEEP) lead biologist in 2010, Connecticut's Osprey population went unmonitored for several years until the start of Osprey Nation. In 2014, the Connecticut Audubon Society conceived and initiated

Osprey Nation in partnership with DEEP. Over 100 volunteers recorded data for 174 Osprey nests around the state. It became clear after the first season that a properly trained volunteer base could provide more comprehensive coverage of the state's Osprey population than a handful of biologists. Over time, the project has gained more volunteers who have continued to improve our understanding of the population. Connecticut Audubon has developed and modified online data collection tools to increase the quality and quantity of data collected. In the 2023 season, the project continued to use several online submission forms with a slight modification to the nest status classifications that were first developed in 2021.

OSPREY NATURAL HISTORY

Ospreys *(Pandion haliaetus)* are one of the most widespread and recognizable raptors in the United States and around the world. Ospreys prey on almost exclusively fish, which makes them heavily dependent on wetlands, rivers, lakes, and oceans (Bierregaard et al. 2020). In Connecticut, the majority of Ospreys nest along the coast and also concentrate along major rivers (Connecticut, Housatonic, Thames) (Figure 1). Throughout most of their range, Ospreys nest on cliffs, boulders, trees, and in some instances on the ground (Bierregaard et al. 2020). Across Connecticut's heavily populated and developed landscape, Ospreys have taken advantage of telephone poles, cell towers, and human made platforms to build their nests. The adaptability of Ospreys has been one of the most crucial components of their persistence into today.

In the mid- 20th century, Ospreys experienced a significant population decline, with some of the steepest losses occurring in the Northeast. On the developed coastline between New York and Boston approximately 90% of Osprey pairs disappeared. This decline was so extreme for Connecticut Ospreys that in 1970 the population reached an all-time low of only eight breeding pairs detected in the state (Spitzer & Poole 1980). Ongoing research at the time determined the cause of the population decline to be an organochlorine pesticide, DDT. At the time, DDT was accepted as an effective and widely used pesticide, but it built up in waterways and aquatic food webs leading to thinner eggshells and lower reproductive rates for Ospreys (Ames 1966). In 1972, DDT and associated pesticides were banned in the United States and the populations of many birds, including Ospreys, have slowly recovered (Spitzer & Poole 1980). Although today Osprey populations are considered stable, they face newly developing threats such as human disturbance, collisions with human-made structures, fishing line entanglements, and other unknown threats on their wintering grounds.

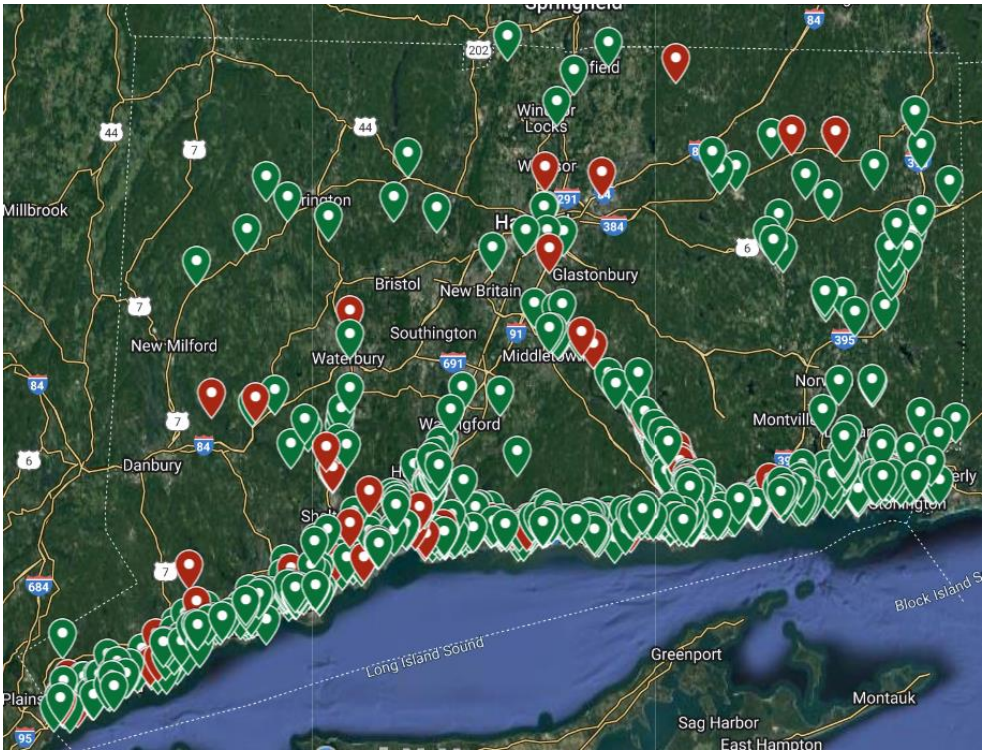

Figure 1. Observed Osprey nesting locations in Connecticut during the 2023 Osprey Nation season. Green locations represent nests with reported data, including nests that were successful, incubation failures, post-hatch failures, active, abandoned, undetermined, or destroyed. Red locations represent nests for which there were no data for this season. All pins will be reset to the same color at the start of the 2024 season.

THE 2023 SEASON

The Season Effort

The 2023 effort represented another record year for Osprey Nation. Since the project's inception, it has gained stewards each year (excluding 2020 - due to Covid-19) and 2023 was no exception (Figure 2). This season there were 411 official stewards and many other residents who volunteered to monitor Osprey nests. This represents a 7% increase from the 2022 season and a 311% increase since the start of the project in 2014. This year's stewards were mostly returning members with 64% having participated in Osprey Nation in the past. Stewards collected data at 943 nests across the state, a 14% increase since 2022 and the most in project history (Figure 3). Among these 943 nests were 111 new nests, some of which were in towns that did not have documented Osprey nesting activity in 2022 such as Chaplin, Griswold, North Windham, and New Preston.

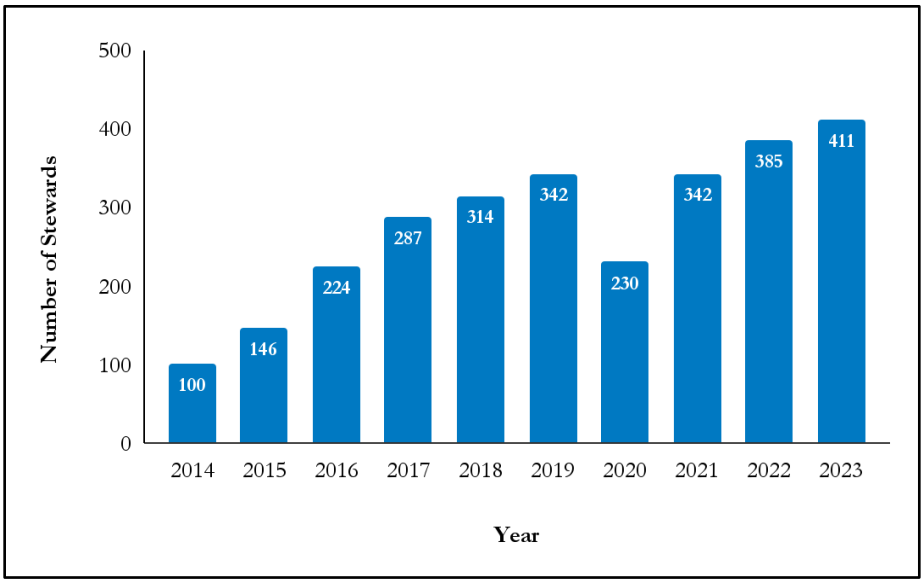

Figure 2. Stewards since Osprey Nation's start (2014-2023). The project has seen a general increase in volunteers since 2014 excluding a decrease in 2020 due to the Covid-19 Pandemic.

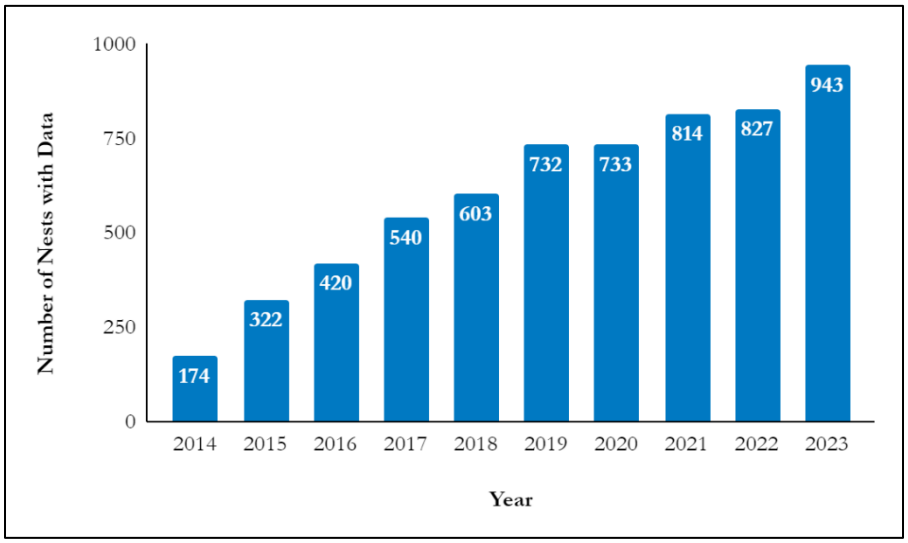

Figure 3. The number of nests with data since Osprey Nation began (2014-2023). The project has seen an increase in nests with data across the 10-year period which is likely due to an increasing Osprey population but also an increase in the number of stewards.

Osprey Monitoring

The increased monitoring effort that characterized the 2023 season identified a record number of active Osprey nests: 688 (Figure 4). Of these, 89 experienced incubation failures, 38 experienced post-hatch failures, 100 remained active (i.e., breeding activity was documented but a definitive outcome could not be determined), and 461 nests successfully fledged chicks. The successful nests

produced 881 fledglings, representing a 5% increase from 2022 and the most fledglings ever detected by the project (Figure 5).

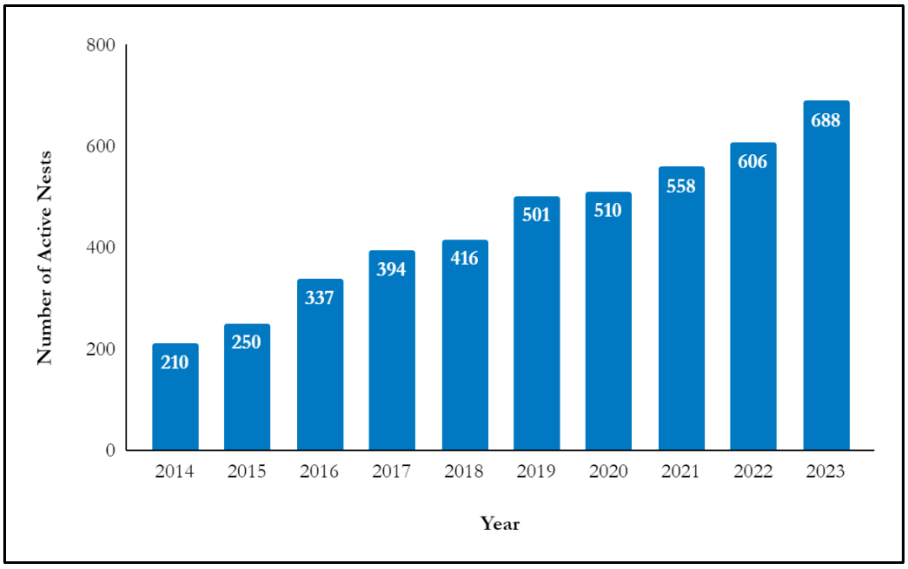

Figure 4. Active nests since the project began (2014-2023). These nests represent locations where breeding attempts were initiated (successful nests, incubation and post-hatch failures, and active nests). The 2023 season saw a continued increase in the number of active nests detected.

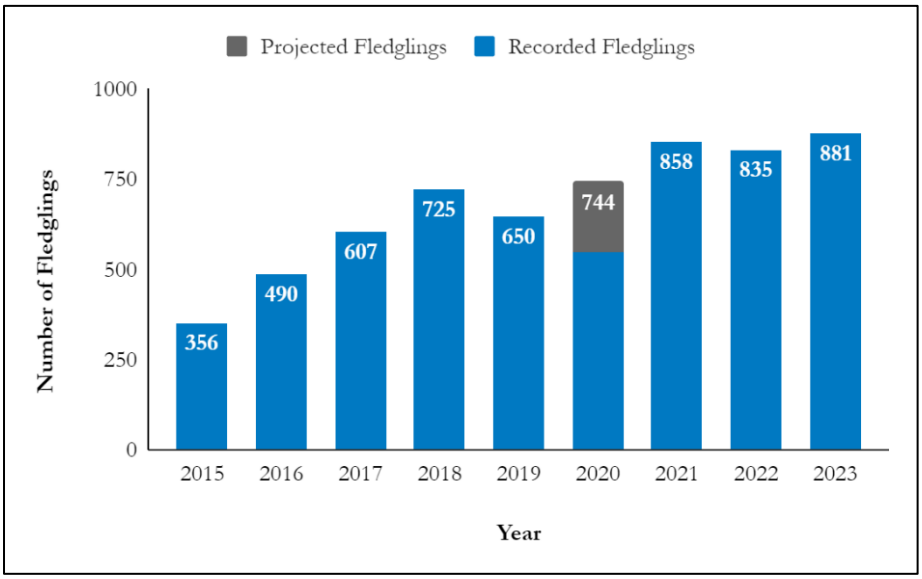

Figure 5. The number of confirmed fledglings since Osprey Nation began recording fledgling information (2015-2023). The general trend of fledglings has been positive with an increase to a record 881 in 2023.

Even though 881 represents the most fledglings on record, the productivity rate decreased to 1.28 from 1.38 in 2022, representing the one of the lowest on record since 2014 (Table 1). There are several hypotheses as to why this decline was observed in 2023, but data collected in future seasons

will help further understand this trend. One potential reason relates to an increased amount of volunteer effort mid-season that left a high number of active nests unconfirmed without final nest outcomes (see the Discussion, below). Another potential reason is that with an increased monitoring effort across the state this productivity value is nearing the true value for this population.

Vacant Platform Identification

In 2023, we changed the nest classification system to include a designation for vacant platforms (Table 2). The goal was to distinguish between suitable Osprey nest sites that were not being used at all (vacant platforms) and nest sites where Ospreys were present but no breeding activity took place (in other words, where nests were abandoned). This season, stewards identified 70 vacant platforms and 87 nests that were abandoned before breeding took place.

Table 2. Osprey Nation nest status designations used during the 2023 season. Final designations, especially fledgling counts, were estimated conservatively based on steward observations and notes. In order to confirm that chicks being counted as fledged originated in the nest they were observed in, consistent observations were required to confirm final fledge counts.

Nest Designation	Description
Successful	Nest produced at least one chick that fledged
Active	Incubation posture or young incapable of flight observed
Incubation Failure	Clear sign of incubation, but no evidence of hatch
Post-Hatch Failure	Clear signs of hatch but no evidence of surviving young
Abandoned Pre-Hatch	An established nest site that adult birds occupied but did not breed at
Destroyed/Removed	Platform or nest was destroyed or damaged
Vacant Platform	A platform that did not have any nesting activity this season but remains a suitable potential nest site
Undetermined	A nest site that had continual adult presence throughout the season, but breeding behavior could not be confirmed
No Data	No data reported this season

Osprey Mortality & Entanglements

This season, there were 18 reported (non-chick) Osprey deaths across the state — 10 adults and eight juveniles, primarily from the state's coastal region, where there are the highest number of nesting Ospreys. This number represents a small fraction of the state's population, and based on steward reports we suspect more deaths occurred. For seven of the deaths, the likely cause is unknown. Of the others, six are believed to be anthropogenic-related deaths (e.g., vehicle strikes) and the other five were suspected natural deaths (e.g., predation). There were at least two reports of adult Osprey entanglements in fishing line and balloon string, but there were possibly more that went undetected. In each reported instance, both Ospreys were able to free themselves and there were no reports of Osprey deaths as a direct result of becoming entangled.

Prey Delivery Rate Analysis

This season, the project conducted a preliminary analysis of Osprey prey delivery rates. Prey availability and delivery rates can contextualize changes in nest success, productivity, and overall population size (Academia & Dalgleish 2022, Steenhoff & Newton 2007, Bretagnolle et al 2008). The goals of this preliminary analysis were to increase the utility of already collected steward data, provide a framework for prey rate analysis in the future, and create a dataset that can be compared to other relevant prey studies for this population such as Giantomidis (2018).

The analysis was conducted using information from the steward reporting forms and only 5 nests met the criteria for analysis. To ensure sufficient data had been collected, nests were included only if they had more than ten observations exceeding 45 minutes. To mitigate observer bias, if two nests being observed by the same steward met the criteria, one was randomly excluded. None of the nests included occur in the same town and each had observations throughout the nesting season. Stewards are less likely to visit failed nests for long periods of time, therefore, this analysis has an assumed bias favoring successful nests. Because the start time of observations is not a required field on the datasheet, observations could not be randomized by time of day.

Across the five sample nests, observers documented 23 prey deliveries in 74.2 hours of observation. All sampled nests were successful with one nest fledging a single chick, three nests fledging two chicks and one nest fledging three chicks. The average prey delivery rate for this sample is 0.32 fish per hour, which is similar to other reported populations (Academia & Dalgleish 2022, Byrd et al. 1986). Continuing this analysis in future seasons, with the goal of increasing the number of sample

nests and the diversity of nest outcomes, may further stabilize Connecticut's delivery rate near that of other populations.

DISCUSSION

If the 2023 season has proven one thing, it's that Osprey Nation is continuing to grow even in its 10th year. The interest and dedication of Connecticut's residents in monitoring and protecting Ospreys has generated another record year. Stewards have established more widespread monitoring coverage of existing Osprey nests and have found many more new nests.

This record effort documented an all-time high count of fledglings which reversed the 2022 season's decreased fledgling count from 2021 levels. However, the productivity of Osprey nests declined for the second year. There are several possible explanations for the decline, which will be a focus of work in future seasons.

One potential reason for the decrease in observed productivity may be the burst of project interest mid-season. Many stewards signed up in early July, responding eagerly to our call for more nest coverage statewide. However, in some instances stewards were not able to make subsequent observations, leaving the final designation of those nests as active with no confirmed fledglings. This effort significantly contributed to the understanding of how many active nests are in the state; going forward early season sign ups and continual monitoring throughout the season should be encouraged.

Another potential reason for the observed decline in productivity might be that Osprey Nation stewards have become so numerous and widespread that they have found close to all the nests in the state (even though there's no way of knowing exactly what that number will be).

In the early years of the project, many of the Osprey nests found by the volunteers were located near the coast and major rivers. With increased monitoring coverage across the state, the project is discovering more nests in places where they were not expected. Therefore, it might be possible that these newly-found nests are less productive because they are in lower quality habitat than the nests identified in the early years of the project, potentially indicating that the population is nearing carrying capacity.

After just two seasons, there is no way of knowing if the observed decline in productivity from 2021 can be attributed to either of the above reasons. In 2024, promoting full season monitoring of nests may help to test the first hypothesis.

Furthermore, a continuation of the prey delivery rate analysis next season, as well as potentially looking to quantify high- and low-quality habitat for Ospreys may help test the second hypothesis.

As the project has gained more interest, the growing volunteer base is eager to contribute to Osprey conservation beyond collection of this baseline data. The 2024 season should aim to continue supporting stewards whenever possible in their efforts to clean-up fishing lines, install nesting platforms, and develop signage to protect nesting Ospreys. These efforts and more are crucial to supporting and understanding the health of Connecticut's Osprey population.

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APPENDIX A.

CT Audubon thanks all our stewards listed below and the many others who have helped contribute observations – Osprey Nation would not be the success it is today without your efforts! This year, we especially recognize and remember the contributions of Osprey Steward Sue Winkler, who passed away this season.

Adam Tulin, Aileen Oconnell, Alan Kendzior, Alden Smith, Alex Koumanelis, Alison Mead, Alison Zyla, Amanda Baker, Amanda White, Amy Ahasic, Amy Barrett, Amy Edwards, Amy Poturnicki, Amy Schlubach, Andrea Bunger, Andrew Crispino, Andrew Griswold, Andrew Towle, Anjani Jain, Ann & Jon Colson, Ann Judd, Ann Milner, Ann Orsillo, Anna & Charlotte Brady, Anna Reiter, Anne & Joseph Kugielsky, Anne McNulty, Anne Stephan, Ardys Rosenthal, Barbara Landau, Barbara Ryden, Becky Gerace, Ben Philbrick, Bennett Pudlin, Beryl Thorpe, Beth Mariotti, Betsey Copp, Betty Hadlock, Betty Slanetz , Beverly Propen, Bill Herbert, Bill Ponterella, Bill Watts, Bob and Jen Singer, Bob Myers, Bob Perry, Bob Taddeo, Bonnie Berk, Bonnie Castellani , Brenda Rich, Brian Geddes, Bridgeport Regional Aquaculture School Students, Bridget Cervero, Bryan Bashaw, Candace Clark, Candi Calcandy, Cara Biega, Cara Stelzel , Carey Bates, Carol & Ken Scandariato, Carol Casserino, Carol Dunn, Carol Stevens, Caroline and Doug Erni, Carolyn Doan, Carolyn Morrison and Larry Brockett, Catherine Mennenga, Catherine Suski, Cathy DeMeo, Cathy Malin, Cheryl Fitzpatrick , Chet Kirby, Chris Gardner, Chris Graham, Christine Gaynor, Christine Peyreigne, Chuck Fitzgerald, Cindy O'Neil, Cindy Slane, Clara Buitrago, Clarence & Jana Hayes, Claudia Pessagno, Craig Coleman, Craig Healy, Cynthia Ehlinger, Cynthia Konney, Cynthia Lee, Cynthia Wacha, Dale DiFronzo, Dan Broom, Dan Rottino, Daniel Riecker, Darcy Ellis, Darlene Briggs, Dave & Kathy O'Brien, David & Fiona Rohde, David and Lisa Roger, David Cox, Deanna Baker, Deanna Broderick, Deb Cody, Deb Eccleston , Debbie Vessels, Deborah Cohen, Deborah Lepine, Deborah Minor, Debra Perez, Denise Palnitkar, Diana Cirillo, Diana Whitelaw, Diane Hull, Diane Joslin, Diane Volz, Diane Von Schleusingen, Dianne McHutchison, Dina Tresnan, Don Schwartz, Donna Hansen, Donna Laviolette, Donna Meadors, Dorothy Wadlow, Dottie Gutaj, Doug Van Tornhout, Eileen Kopec , Elizabeth Maroney , Elizabeth Sammarco, Ellen Kennedy, Ellen van Wees, Ellen-Marie DiGioia, Eric Wilson, Erin Grady, Erin Mahoney, Erol Fikrig, Eugene Ralph, Evan Griswold, Faith Leitner , Francis Cavanagh, Frank Damiano, Frank Sandler, Frederick Crosby, Freyda Rose, Gail Munn, George Presti, Glen Cummings, Glenn Erickson , Gloria Moss, Graham Griffin, Greenwich Conservation Dept. - Rebecca Poirier, Greg Brenner , Greg Peck, Gretchen Levesque, Gretchen Whitteberry & William Kenyon, Groton Utilities - Ron Bata, Guldeniz Yucelen, Heather Milardo , Heather Williams, Heather Ziemba, Helen Adams, Holly Turner-Moore, Howard and Eden Diamond, Hugh McManus, Isabelle Paggioli, Jacob Brown, Jacquelyn Conn, James Doan, James Wickwire, Jamie Rock , Jane Aldieri, Jane Jacobson, Jane Purcell, Janer Belson, Janet Messick, Janet/Robert Sundman, Jared Boulet, Jarrod Ackles, Jay Harwin, Jean Claude Ambroisr, Jean Hopkins, Jeanne Harris, Jeanne Moore, Jeff Kiernan, Jeffrey Rodia, Jen Place, Jenn Healy, Jennifer Diagostino, Jennifer Hollstein, Jerilyn Duefrene, Jessica Calle, Jessica Gray, Jill Notar-Francesco, Jim & Bette Collins, Jim Denham, Jo Fasciolo, Joan Tilson, Joan Tracey Seguin, Joe Carney, Joe Gerace, John Brezina, John Cunningham, John DeMarsilis, John Duddy , John Groton, John Kofron, John Makowski , John Nichols, John Ogren, John Sargent, John Stoddard, Jose Pereira, Joseph Canterino, Joseph Szalay, Josh Weinstein, JP Babineau, Julia Gwen Rice, Juliana Garofalo, Kaitlin Mochi, Kaitlyn Olszewski, Karen Drena , Karen Gallo,

Karen Harris, Karen Morley, Karen Smith, Karen Stigliano, Karin Dionne, Karissa Reynolds, Kate Webb, Kathleen DePasquale, Kathleen Riley, Kathryn Hotchkiss, Kathy Kirkland, Kelly McHale, Kelly Quinn, Ken Ewell , Kendra Wingate, Kenneth Mull, Kevin Blagys, Kevin Corrigan, Kristin Hays, Kylie McGinnis, Larry Reiter, Laura Bastien, Lauragene Lyons, Lauren Logan, Lauren Magliola, Laurette Saller, Lee Penn, Leigh & Niko Knuttel, Lesley Orlowski, Leslie Van Orsdel, Lewis Spero, Linda Edwards, Linda Kornmeyer, Linda Nickerson, Linda Tomas, Linda Wenner, Lindsay Sheldon, Lisa and Jim McKay, Lisa Falasco, Lisa Jarosik, Lisa Lovejoy, Lisa Tryon, Lisa Zawadski, Liz Hellwig, Liz, Rob, and Eve Coolidge, Loralee Richter, Lori Bassett, Lori Gruen, Lori Smith, Lorraine Domijan, Lorrie Shaw, Louise Crocco, Lucy Crescenzi, Luke Giroux, Lynn Craska, Lynn Dorsey, Lynn Johnson, Lynn Kramer, Madeline Raleigh, Maire Valade, Maizie Ogren, Marc Muller, Marcia Wilcox, Margaret Damiano, Margaret Fikrig, Margaret Kelly, Margret Hofmeister, Maria Ehrhardt, Marilyn Carolina, Mark Geist , Marla Whalen, Marsha Vetare, Martha Lee Asarisi, Mary Anne Hardy, Mary Barravecchia , Mary Casey, Mary Seidner, Mary Spagnolo, Mary Sue Hermann, Maryann Leach, Maura Bonafede, Maureen Bashaw, Maureen Greco, Maureen O'Brien, Maureen Scalia, May Hoyt, Megan Czekaj, Megan Gibson, Michael G. Mishik, Michael Horehlad, Michael Kiselak, Michele Millham, Micky Komara, Mikayla Roush , Mike & Anna James, Mike and Roni Widmer, Mike Ferry, Miriam Gardner-Frum, Molly & Alen Aykut Tanis, Molly McCann, Morgan Werner, Myra & John Ambrogi, Nancy Anderson, Nancy Breininger, Nancy Cleary, Nancy James, Nancy Moon, Natalie Evans, Nell Twining, Nick Maiorino, Nicole Rivard, Pam Paulman, Pamela Jones, Pamela Reeser, Pat Suprenant, Pati Laudano, Patricia Brune, Patricia Collins, Patricia Mazella, Patricia Pickard, Patti Decker, Patti Palmer, Patty Nizlek, Paul Connolly, Paul Criscuolo, Paul Noel, Paul Stigliano , Paul Vivian , Paula McCarthy , Paula Wolf, Peter Alessi, Peter and Diana DeLisa, Peter Lombardo, Polly and Steve Parker, Ray Gaulke, Rebecca Dombrowski, Ren Harman, rick allison, Rick Baumhauer, Rick Gedney, Rick Landau, Rick Newton, Robert Raufeisen, Robert Stanton, Robert Stout , Robin & David Wallace, Robin Copperthwaite, Ryan Hughes, Sandra Jones, Sandra Mello, Sandra Robinson, Sandy & Ed Ianello, Sandy Newton, Sandy, Jacob & Zachary Fox, Sara Lowenthal, Sarah Davison, Sarah Johnson, Sarah Kuchta-Humphrey, Scott and Donna Brinckerhoff, Scott and Karen Harris, Sharon Foster, Sharon Hirsch, Shayna Petit, Shelley Sherbondy, Shirley Clevenger, Stacy & Norm Tattar, Stephanie Kollet, Stephen and Joan Kobak, Stephen Potter, Steve Galkin, Sue Driscoll, Sue Petit, Sue Winkler, Susan Durant, Susan Franco, Susan Gagliardi, Susan Kayeum, Susan Taff, Susan Worboys, Suzanne Cahill, Suzy & Reno Bolduc, Sylvia Laudette, Tammy Barber , Tanisha Bergeron, Tanya Patten, Thomas Merrill, Timothy Widmer, Tom McLoughlin, Tom Robinson, Tom Thompson, Tony Spinelli, Valerie Richardson, Valerie Workman, Vickie & Jeff Cotton, Vincent Florentino , Virginia Wahl, Will Dittman, William Chantrell, William Pacelli, Xiaoyi Ouyang.