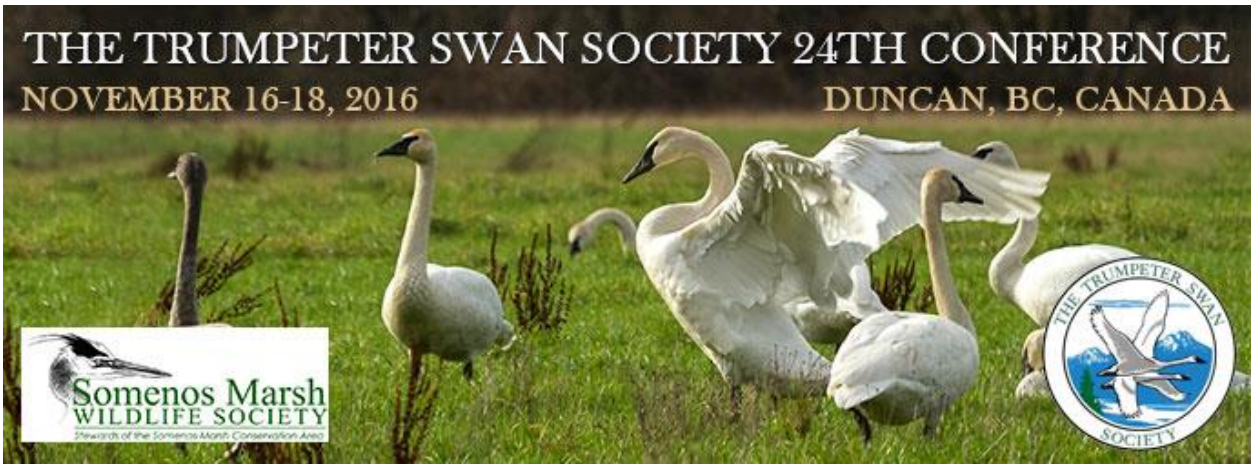

Twenty-Fourth Conference

"**Swans and Agriculture. Working Together"**

PRESENTATION ABSTRACTS

THE TRUMPETER SWAN SOCIETY

Quw'utsun' Cultural and Conference Centre

Duncan, British Columbia

November 16-18, 2016

ABTRACTS FOR PRESENTATIONS

THE SOMENOS MARSH WILDLIFE SOCIETY FROM THE FRIENDS OF SOMENOS TO TODAY

Paul Fletcher, Somenos Marsh Wildlife Society, Box 711, Duncan, BC, Canada, V9L 3Y1

ABSTRACT

Paul discovered Somenos Marsh, or Somenos Flats as it was locally known then, on his arrival in the Cowichan Valley in 1986. Somenos is about 200 hectares of seasonally flooded fields, wetlands, upland forests, willow scrub and a small lake very close to a small city and surrounded by urban growth. As a photographer, and an amateur naturalist, he recognized the intrinsic value that this natural area would hold for the community if properly protected for all time. Paul had experienced already-protected natural areas in Alberta and recognized that, in addition to the important habitat for animals, the popularity of these places offered economic return from local and far away visitors. Upon investigation he learned that Somenos was not protected at all. He joined the Cowichan Valley Naturalists Society to encourage efforts towards preservation of the area but they wanted to avoid the confrontations that would come from resisting the urban pressures on the area. After a time on their board it was agreed that the naturalists would fund an offshoot organization who would focus their efforts on preserving Somenos in its current state. Thus was born the Friends of Somenos who eventually incorporated in 1989 as the Somenos Marsh Wildlife Society (SMWS). Many years later, Paul and the SMWS are still resisting urban growth pressures but at the same time but are now working cooperatively with their previous adversaries as partners in the now named Somenos Marsh Conservation Area. The partners are now very close to formalizing the borders of a much larger area and applying both provincial and municipal protection designations on the Somenos lands.

A CELEBRATION OF SWANS: YUKON'S PREMIER BIRDING FESTIVAL

Scott Cameron, Yukon government, Department of Environment, 10 Burns Road (V5N), Whitehorse, YT, Y1A 2C6

ABSTRACT

Each spring approximately ten per cent of Yukon's population participates in *A Celebration of Swans*, a birding festival organized by Yukon government's Wildlife Viewing Program. The festival occurs in April as waterbirds, most notably the Trumpeter Swan, migrate through southern Yukon enroute to their northern breeding grounds. Multiple festival events occur from early April to early May including guided walks, presentations, children's programming and arts workshops. Many community organizations and local individuals contribute to the festival by leading events and contributing expertise and funding. The hub of the festival is the Swan Haven Interpretive Centre on the shores of M'Clintock Bay, Marsh Lake. Thousands of swans, ducks and geese use M'Clintock Bay as a staging area during migration and the viewing opportunities are impressive. Beyond educational and nature-appreciation roles, *A Celebration of Swans* also serves a wildlife management function. Reducing ground-based and water-based disturbance of resting waterbirds,

especially during migration, is the key goal of the festival. In fact, the Swan Haven Interpretive Centre was created primarily to encourage respectful viewing and behaviours near migrating waterbirds. For over 20 years *A Celebration of Swans* has facilitated learning and discovery of migrating waterbirds in southern Yukon.

"TRUMPETING THE CAUSE FOR WETLANDS"- IOWA'S PUBLIC OUTREACH EFFORT

David Hoffman, Iowa Department of Natural Resources, Clear Lake, IA

ABSTRACT

A second objective of Trumpeter Swan restoration in Iowa is to "Trumpet the Cause for Wetlands". Trumpeter Swans serve as excellent ambassadors in Iowa for promoting wetland values, water quality, the environment, and enriching the quality of life. Over 400 swan releases and 30 winter swan viewing events, "Swan Soiree", have been conducted by the Iowa Department of Natural Resources and county conservation staffs. The public and the media have been invited to attend. These public programs have been very popular. The goal is to educate, engage and connect people to the Trumpeters and also to their habitat. An estimated 5,000-15,000 students and citizens have been impacted annually since 1995. Observed results have included a greater awareness, appreciation, and a call to action. Unforeseen results have included a few students and adults being infected by "Swanitis", with an overwhelming passion to help restore, enhance and protect swans and their wetland habitat. This has translated to additional wetland acres being restored by passionate landowners with the hope of attracting Trumpeters to their property. Donations have also been received at these events to help support swan restoration. Money has come from a wide variety of swan enthusiasts, conservation groups, and charities. When combined with considerable soft match/in-kind contributions, a conservative estimate totaling over 1.5 million dollars has been raised. This money was used directly to fund swan reintroduction in Iowa. Additional outreach included a Trumpeter Swan and wetland education and activity manual. It was developed by Ron Andrews in 1996 and distributed to Iowa school teachers. A current goal is to update the manual and offer if it for nationwide distribution. The public outreach effort has been a huge success by raising awareness in regards to these magnificent birds and also producing sufficient funding to carry out the work.

PACIFIC BIRDS HABITAT J0INT VENTURE – MOVING FORWARD

Lora Leschner, Pacific Birds Habitat Joint Venture, Arlington, WA

ABSTRACT

"We do not need to look at the migration pattern of a species as though it were a piece of sedimentary rock formed through eons of slow change,"* Smithsonian researcher John H. Rapple wrote in 1992. *"Migration is a dynamic process, surely subject to evolutionary change."

Like migration patterns, Pacific Birds Habitat Joint Venture is evolving with a new business model that seeks to build stronger partnerships, enhance funding, build stronger communication networks, and promote avian conservation decisions over a larger landscape level. In the past year, we have shifted our operations to focus on habitat needs for birds at the flyway scale, and narrowed our conservation priorities: Preserving Oak and Prairie Habitat, Sustaining Coastal Wetlands of the Pacific Northwest, and Conserving Hawaii's Wetlands and Waterbirds. Within each of our conservation priorities, we are building collaborative forums that address the greatest conservation needs, whether they are in planning, funding, science, communications or

policy. Pacific Birds will continue work with long-established partners, such as The Trumpeter Swan Society, enhance networking and funding to build new partnerships, with an eye toward strategic accomplishments for habitat conservation.

MIGRATORY BIRD TREATY CENTENNIAL AND TRUMPETER SWANS

John Cornely, The Trumpeter Swan Society, Littleton, CO

ABSTRACT

The Migratory Bird Treaty of 1916 is one of the most important and effective pieces of conservation diplomacy in history and undoubtedly played a critical role in saving Trumpeter Swans from extinction. Before Europeans colonized North America there may have been 130,000 Trumpeters on the continent. As the newcomers hunted for food and commerce and began to modify the landscape numbers of swans plummeted. Tens of thousands of Trumpeter skins and millions of swan and goose quills were shipped to Europe in the 1800s. Unregulated market hunting not only took a serious toll on swans, but many other species of wildlife and fish. By 1900 many species were in serious trouble and conservation efforts were meager. Canadian and U.S. citizens grew increasingly concerned at the alarming reduction of resources once thought unlimited. They began to pressure elected officials to take action. Some steps were taken in each country to limit harvest, but they were woefully in adequate. Because migratory cross international boundaries during their annual travels it became clear that their conservation required international conservation. Collaboration between Canadians and Americans finally led to the "Convention between His Majesty and the United States of America for the protection of Migratory Birds in Canada and the United States". King George V of Great Britain signed for Canada and President Woodrow Wilson for the United States. Canada enacting implementing legislation in 1917 and the U.S. followed suit in 1918. It was almost too late for Trumpeter Swans. By the 1930s their numbers in the U.S. were less than 70 and small numbers were later found in Alaska and Canada. The Treaty provided a strong foundation for migratory bird recovery and conservation in North America. Efforts by many partners in the two countries resulted in increasing numbers of Trumpeters and other birds. The success of the Treaty led to negotiations of subsequent migratory bird treaties with Mexico (1936), Japan (1972), and the USSR (1976). As we celebrate the magnificent Trumpeter Swan this week, let us also celebrate the 100 anniversary of the landmark treaty that facilitated their recovery!

TRIBUTE TO THE TRUMPETER

Pamela Roberson, ClearLight/Photography, Bellevue, WA

ABSTRACT

TRIBUTE TO THE TRUMPETER is a 15 minute slideshow which showcases Pacific Coast and Rocky Mountain Trumpeter Swans through the cycle of the seasons from cacophonous staging in the white world of spring migration, Yukon Territory, Canada, to the peaceful, windy beginnings for five cygnets in the

headwaters of the Centennial Mountains, Montana, and through wet winters in the lakes and lands of western Washington.

Smooth jazz; classical music accompanies this visual tribute to the spectacular wildness and beauty of *Cygnus buccinator*. This 15 minute program, created for the 24th Swan Conference, was 7 years in the making. Enjoy.

THE 2015 NORTH AMERICAN TRUMPETER SWAN SURVEY

Deborah J. Groves, U.S. Fish and Wildlife Service, Juneau, AK

ABSTRACT

The North American Trumpeter Swan Survey has been conducted approximately every five years since 1968 to monitor the status of Trumpeter Swans (*Cygnus buccinator*) in North America. The 2015 survey, like previous surveys, was a cooperative effort of federal, state, and provincial agencies and private individuals across Canada and the northern United States. The primary survey objective in 2015 was to estimate the abundance of white swans (adults and subadults) in North America and within the three recognized Trumpeter Swan populations: Pacific Coast (PCP), Rocky Mountain (RMP), and Interior (IP). For the first time since the survey's inception, the collection of cygnet-abundance and other productivity data was optional. The 2015 survey was conducted between January and September, primarily late April through September. Methods varied among regions and in some regions changed substantially from prior years, thus caution is warranted when comparing results. The continental estimate of white swan abundance was 62,865 (SE = 3,126), which was the highest estimate since the surveys began in 1968. White swan estimates for the PCP, RMP, and IP were 24,089 (SE = 1,114), 11,721 (SE = 227), and 27,055 (SE = 2,912), respectively, all record-high estimates as well. The PCP, RMP, and IP comprised 38%, 19%, and 43% of the continental white swan population, respectively. For the first time in the survey's history, the IP exceeded the PCP and contained the largest percentage of the continental population. All of the PCP and RMP cooperators collected brood and/or cygnet data, which enabled productivity estimates to be derived for these populations. In the PCP, the mean brood size was 3.02 and cygnets comprised 24% of total swans. The percentage of cygnets in the RMP was 32%. The North American Trumpeter Swan Survey should be continued at 5-year intervals to monitor the status and trend of Trumpeter Swans over time.

DELIVERY OF THE 2015 CONTINENTAL TRUMPETER SWAN SURVEY IN WESTERN CANADA

Andre Breault, Canadian Wildlife Service, Environment and Climate Change Canada, Delta, BC

Margaret Campbell, Canadian Wildlife Service, Environment and Climate Change Canada, Whitehorse, YT

Garnet Raven, Canadian Wildlife Service, Environment and Climate Change Canada, Edmonton, AB

ABSTRACT

In Western Canada, the continental Trumpeter Swan (*Cygnus buccinator*) survey tracks the summer distribution and abundance of Rocky Mountain Population (RMP) and Pacific Coast Population (PCP) birds. It was historically a census through 2005. The census approach was replaced in 2010 with a stratified random design that achieved a CV of 0.06 and resulted in significant cost savings. In 2012, the Canadian Wildlife Service national review of bird monitoring programs recommended the use of a stratified random sampling approach to deliver the 2015 continental survey in Western Canada. Distribution and abundance data from earlier continental surveys, supplemented with data from other sources such as eBird, were used to design the 2015 survey. Swan sightings were overlaid with 1:50,000 topographic maps within the known Trumpeter Swan range and 4 abundance strata (0, 1-10, 11-49 and 50+ total birds per map) were generated. To account for range expansion between surveys, a 20km buffer was added to previous observations to generate the available survey area. Topographic maps to be surveyed (100 for the RMP and 22 for the PCP) were chosen randomly in each abundance strata. Surveys were primarily conducted by fix-wing (Maule M-7 in BC and the Yukon and Partenavia in Alberta) although a rotary-wing aircraft (B-206 Jet Ranger) was also used. The 2015 estimate for RMP swans in Western Canada was 16,143, an 80% increase compared to the 8,950 estimate for 2010. The 2015 estimate for PCP swans in Western Canada was 2,979, a 106% increase vs. the 1,443 estimate for 2010. All jurisdictions exhibited population growth compared to 2010. Changes to the survey methodology in 2010, range extension and the random selection of topo maps that were not covered by the 2010 survey are thought to partially explain the increase in abundance of RMP and PCP swans in 2015.

DIFFERENTIATING SOURCES OF VARIANCE IN THE 2015 CONTINENTAL TRUMPETER SWAN SURVEY IN YUKON AND NORTHERN BRITISH COLUMBIA: POPULATION GROWTH VS FLIGHT PATH

Margaret Campbell, Canadian Wildlife Service, Environment and Climate Change Canada, Whitehorse, YT

Andre Breault, Canadian Wildlife Service, Environment and Climate Change Canada, Delta, BC

Jim Hawkings, Canadian Wildlife Service (Retired), Whitehorse, YT

ABSTRACT

Population estimates of Trumpeter Swans (*Cygnus buccinator*) breeding in western Canada have increased significantly between the 2010 and 2015 continental surveys: 80% for the Rocky Mountain Population (RMP) and 106% for the Canadian portion of the Pacific Coast Population (PCP). Breeding surveys have used a stratified random sample based on 1:50,000 topographic map squares since 1995 in the Yukon and 2010 in

parts of northern British Columbia (BC). U.S. Fish and Wildlife Service midwinter surveys of the RMP estimate that the population grew by 5.4% annually from 1972-2013. Yet the Canadian breeding population estimates have increased by 80% over a five year period or approximately 16% annually. Previous work in northern BC estimated that 22-28% of the increase in population breeding estimates were as a result of differences in survey methodology; census in 2005 and stratified random sample 2010. We compared data from 2010 and 2015 to differentiate between the effects of survey flight path coverage and population growth on the 2015 population estimates.

ONTARIO TRUMPETER SWAN (*CYGNUS BUCCINATOR*) STATUS UPDATE AND RESULTS OF THE 2015 NORTH AMERICAN TRUMPETER SWAN SURVEY

Kyna Intini, Ontario Trumpeter Swan Restoration Team, Dundas, ON

Julie Kee, Ontario Trumpeter Swan Restoration Team, Hamilton, ON

Beverly Kingdon and Ray W. Kingdon, Ontario Swan Restoration Team, Burlington, ON

ABSTRACT

The fifth North American Trumpeter Swan Survey (NATSS), for the Ontario Region was completed in 2015. The survey was done in two parts, consisting of a wintering ground survey completed in January and early February in southwestern Ontario and a late August – September aerial, photographic survey in northwestern Ontario. The winter portion involved 41 hours of aerial, photographic surveys conducted by the Canada Wildlife Service (CWS) and Long Point Waterfowl (LPW) as well as ground surveys conducted by the Ontario Trumpeter Swan Restoration Team (OTSRT), Ontario Ministry of Natural Recourses and Forestry (OMNRF), Bird Studies Canada (BSC) and a large host of volunteers, over a 2 day period. The area covered the shoreline from Lake St. Clair to the St Lawrence River as well as inland rivers and ice-free areas in southern Ontario. The late summer portion of the survey was conducted by CWS & the US Fish and Wildlife Service (USFWS) with cooperation from the OMNRF. This survey involved 68 hours of aerial, photographic surveys in northwestern Ontario in the Kenora, Red Lake, Fort Frances and Dryden area. In the winter a total of 924 swans (704 adults and 214 juvenile and 6 unknown age) were observed. This count was 1.6 times higher than the 2010 estimate of 594 swans. In the northwestern Ontario late summer survey 1,076 swans were observed, this was 3.9 times higher than the 2010 count of 279 swans. The results for the 2015 5th NATSS for Ontario are a total of 2,000 swans, which is 7.3 times the total of the 2010 survey total of 273 swans. These results should be considered as the minimum known population numbers for Ontario. More work needs to be done in exploring the remote areas of northern Ontario to determine if further trumpeter swan populations not included in previous counts exist. Further research into the season habitat preference and species' ecology will help in developing a more extensive survey protocol. The Ontario banding program is unique to North America, marking birds with patagial tags as well as leg bands. Around 1600 birds have been marked over the course of the 34 years of the program and records have been kept of each bird including biographical data and sightings. Over the last 5 years, there have been 507 birds (108 new adults, 281 cygnets, 118 tag replacements) caught for banding purposes. We estimate 30-40% of the southern Ontario population are marked with tags and bands, with a higher percentage who still carry bands but have lost the tags. The data gathered from this program has been used in several undergraduate thesis. We are in the process of developing a new computer database system so that records can be kept current and future students will have access to this wealth of data.

STATUS ON THE ABUNDANCE LEVELS AND TRENDS FROM THE CURRENT TRUMPETER SWAN SURVEY OF THE ROCKY MOUNTAIN POPULATION U.S. BREEDING SEGMENT IN RELATION TO THE PACIFIC FLYWAY MANAGEMENT PLAN; MISSION ACCOMPLISHED??

David Olson, U. S. Fish and Wildlife Service, Region 6-Division of Migratory Birds, Denver, CO

ABSTRACT

The Rocky Mountain Population (RMP) of Trumpeter Swans (*Cygnus buccinator*) consists of birds that nest primarily from western Canada southward to Wyoming and Nevada. The RMP/U.S. Breeding Segment consists of the Tri-State Flock, which includes those birds that summer in the areas near the juncture of the boundaries of Montana, Wyoming and Idaho, and the Restoration Flocks around Ruby Lake National Wildlife Refuge, NV, and Malheur NWR and Summer Lake Wildlife Management Area in Oregon. Annually in September a fall trumpeter swan survey is conducted by several administrative entities and is intended to provide an accurate count of the number of RMP Trumpeter Swans that summer in the U.S. The annual September counts are compared against the objectives set forth by the 2012 Pacific Flyway Management Plan for the RMP Trumpeter Swans (currently 718 white birds and 165 nesting pairs); which is currently under revision. Observers counted 968 swans (718 white birds and 250 cygnets) in the U.S. Breeding Segment of the Rocky Mountain Population of Trumpeter Swans during fall of 2015, a 58% increase from last year's count (611). Two issues contributed to this large increase. The first and greatest influence was the inclusion of birds from the successful Flathead Indian Reservation reintroduction program for the first time in the count. Second, and possibly less of an influence this year, the 2015 North American Swan Survey was conducted, which entailed an increase in the number of routes and time spent surveying compared to other years. The number of white birds in the Tri-state area (548) increased by 21.2% from last year's count of 452. The total number of cygnets increased 27%, from 137 in 2014 to 175 in 2015. Cygnet counts increased from 2014 by 5.3% and 19.3% for Montana and Wyoming, respectively, while Idaho cygnet production increased from that of 2014 by 104.3% to 47 birds. This is the first time in the history of the RMP planning process for Trumpeter Swans that a population objective has been met with regards to the number of adults and subadults. However, the number of nesting pairs observed in 2015 (115) were at 70% of the plans objective of 165 nesting pairs. Although one objective was met, the need still exists for continued monitoring as part of the adaptive management process. Also, reasonable objectives need to be put in place for the next iteration of the RMP Trumpeter Swan plan due out in 2017.

SWAN SURVEYS IN THE NORTHWEST: THEIR CRUCIAL ROLE IN MANAGEMENT AND HABITAT CONSERVATION

Martha Jordan, Northwest Swan Conservation Association, Mill Creek, WA

Ruth E. Shea, Northern Rockies Trumpeter Swan Stewards, Jackson, WY

ABSTRACT

Since 1976, we have led efforts in Washington State (Jordan) and Greater Yellowstone (Shea) to improve swan surveys through effective private/volunteer partnerships with management agencies. When this effort began, 90+% of all Trumpeters wintering and summering in the western U.S. were found in these regions. Over the subsequent four decades, agencies funded much of the flight costs, while volunteers served as primary observers on many aerial surveys, developed and implemented numerous ground surveys, analyzed and summarized data in many reports to agencies, and provided expertise regarding both the swans and the habitat. Washington swan surveys documented increasing numbers and expanding distribution of wintering swans, as well as long-term winter habitat loss due to conversion of agricultural land (particularly dairies) to uses not suitable for swans, urban sprawl, and short-term losses of habitat due annual weather variation. Winter surveys were complicated by the intermingling of Tundra and Trumpeter Swans. In Washington the partnership with agencies led to the development of the first state swan management plan, systematic ground and aerial surveys in many years, increased understanding of lead poisoning problems, a repository of long-term swan/habitat data, and widespread recognition of the trend of declining available habitat. In Greater Yellowstone, the survey partnerships focused primarily on aerial surveys of nest habitat conditions and nesting effort of resident swans, particularly in Idaho, but also in adjacent portions of Wyoming, Montana and Yellowstone National Park. Ground surveys in summer targeted nesting site problems and in winter recorded hundreds of observations of neck-banded wintering swans. In both Washington and Greater Yellowstone the long-term data sets obtained by these federal/state/private partnerships have enabled managers to better understand population fluctuations, as well as the impact of habitat changes on swan distribution. As agency funding declines, crucial surveys are in jeopardy of termination and the need for innovative partnerships is increasing. To remain effective surveys must follow well documented and consistent methods, be well coordinated across multiple jurisdictions, and timed strategically to gather data most effectively. When properly compiled and stored, these long-term data sets provide an irreplaceable foundation for crucial management and habitat protection decisions.

TRUMPETER WATCH: WHAT HAVE WE LEARNED AND WHAT DO WE NEED TO DO?

Jim Dubovsky, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Lakewood, CO

John Cornely, The Trumpeter Swan Society, Littleton, CO

ABSTRACT

The Trumpeter Swan Society initiated Trumpeter Watch in 2009, whereby individuals were asked to report sightings of Trumpeter Swans to the Society via forms that could be downloaded from the internet. Over the years, people have reported swan sightings using these forms, but also simply by contacting members of the Society through email messages. The response to this citizen-science effort was substantial, and hundreds of sightings have been reported. However, data were not compiled into a readily searchable database, and most remained in paper form. As such, the utility of the information collected was limited. We worked with others to develop a data entry tool using Microsoft Access so that historical data could be entered into an electronic database, with the expectation that doing so would enhance users' abilities to query the data and document any geographic expansion and incidence of occurrence of Trumpeter Swans at various scales. Further, we thought this information would be useful as planning for the 2020 range-wide North American Trumpeter Swan Survey was being considered. The information collected through Trumpeter Watch may identify areas inhabited by aggregations of birds, but not within the current geographic extent of the survey. That information, along with other citizen science information (e.g., E-bird) might allow better targeting of geographic areas for the survey. Additionally, since Trumpeter Watch has been in place for about a decade, the Society should review the information collected to assess whether the data being collected are still needed, given the other sources of information available, and whether the current data form is appropriate for ensuring ease of submission of the data most important to meet objectives. Further, resources should be committed so that data can be entered into an electronic database upon receipt of the information, after conducting adequate quality control efforts.

SWANS AND THE DAIRY FARM HABITAT IN WASHINGTON STATE

Jay Gordon, Washington State Dairy Association, Elma, WA

ABSTRACT

The corn and grass fields of dairy farms in western Washington provide critical habitat for Trumpeter Swans and have for decades. Yet conversion of land to housing, urban sprawl and even other crops is reducing habitat acres and compressing waterfowl feeding, including Trumpeters, on fewer acres of these key habitats. Farmers are seeing ever increasing impacts from more and more birds. What is the outlook? What can be

done to continue to encourage the dairy farmers to continue feeding and hosting waterfowl and specifically Trumpeters? Swans and cows have gotten along well for the past 60 years. They like the same food from the same land. Milk and Swans even share the same color! What will keep this synergy successful into the future?

OVERVIEW AND STATUS OF A DOCUMENTARY ON TRUMPETER SWAN RESTORATION ACROSS NORTH AMERICA

Steve Harryman, Wildlife America Films LLC, Fruitport, MI

ABSTRACT

The effort of so many people across North America to help restore the Trumpeter Swan represents one of the greatest wildlife conservation success stories of our time. This is why we are creating a film that will appeal to the general population, while maintaining historical and scientific accuracy. The film will attempt to tell the complete story of this magnificent bird, focusing highly on the generations who have helped to restore it.

The story will be told from three aspects:

Past: The historical aspect is one of the most important and challenging areas of the film, involving gathering and documenting information that is both relevant and accurate. Different people bring different strengths to a project and we are working with The Trumpeter Swan Society for guidance in the area of historical data pertaining to Trumpeter Swan ranges, management efforts and past pioneers in the cause of the Trumpeter Swan. Access to historical photographs and footage will play an important role in the film. The role of the National Wildlife Refuge System will also be highlighted in the film. A major aspect of the film will be personal interviews with the past and present generations who have helped to restore Trumpeter Swans across North America. Many of those interviews will be with present and past biologists, discussing the restoration programs and efforts they have devoted their time to.

Present: Current restoration efforts across the United States and in Canada also represents an important part of the film. With so many efforts happening across multiple states, provinces and across the different Trumpeter Swan populations, we will put greater emphasis on the major efforts taking place, while also attempting to acknowledge any smaller efforts taking place that are no less important. Citizen efforts will be included, including efforts to reduce telephone wire accidents and other relevant work being done, along with public events where people and swans interact, such as schools and sanctuaries where the public is learning and seeing Trumpeter Swans.

Future: Issues facing restoration efforts today and future locations for reintroduction will be explored. Finally, we will attempt to show where trumpeter swans are beginning to show up on their own, highlighting the success of restoration efforts and overall outlook for the Trumpeter Swan across North America.

THE RECOVERY OF TRUMPETER SWANW IN OHIO

Laura Kearns, Ohio Department of Natural Resources, Division of Wildlife, Delaware, OH

ABSTRACT

The Trumpeter Swan (*Cygnus buccinator*) was reintroduced in Ohio beginning in 1996, after being extirpated from the state for nearly 300 years. Reintroduction efforts continued through 2003, and after that, the population continued to grow. The species was down-listed to state-threatened in 2013. Unfortunately, concurrent increases in the non-native and invasive Mute Swan (*Cygnus olor*) in the state and throughout the region posed a threat to the population. Thus, in cooperation with regional partners, such as the Mississippi Flyway Council, the Ohio Department of Natural Resources –Division of Wildlife developed and began implementing a swan management plan, which called for eradication of mute swans from public lands by the year 2020. Thus far, removal of mute swans seems to have had a positive impact on the Trumpeter Swan populations, and the number of breeding pairs and reproductive output of Trumpeter Swans has reached some of its highest levels in the last few years. Overall, the Trumpeter Swan reintroduction program has been successful in Ohio, and the outlook for the species in Ohio is promising.

STATUS OF TRUMPETER SWAN RESTORATION AND THE PROMOTION OF WETLANDS IN IOWA

David Hoffman, Iowa Department of Natural Resources, Clear Lake, IA

ABSTRACT

In 1993, the Iowa Department of Natural Resources (IDNR), working cooperatively with public and private partners, developed a plan to restore Trumpeter Swans to their former breeding range in Iowa. The primary goal was to restore a self-sustaining, migratory population of Trumpeter Swans. The secondary goal was to use the swans to "trumpet" the positive values of wetlands, including water quality improvement, flood reduction, and groundwater recharge in addition to wildlife habitat. A total of 1,172 cygnets were raised and released from 1995 - 2016. Swans from 121 partnership breeding sites and other sources have been used for re-introduction in Iowa. Public support for the program was higher than anticipated; private donations have exceeded $500,000 with over 1000+ volunteer hours tallied. The first nesting attempt by free-flying swans in Iowa since 1883 was documented in 1998. Through 2016, a total of 536 nest attempts have been recorded in Iowa, with additional nesting attempts by Iowa swans in Minnesota, Wisconsin, Illinois and Missouri. Fifty nesting attempts were documented in Iowa in 2016. The Iowa nesting flock was estimated at 339 Trumpeter swans in 2015. Marked swans from Iowa have been reported in 17 states and 2 Canadian provinces. An experimental release of 49 swans was conducted in Arkansas with the cooperation of Arkansas Game and Fish Commission and The Trumpeter Swan Society in 2008-2010. The project was somewhat successful, with two swans returning north to central Minnesota and two to Iowa. Additional efforts to encourage migration have included the experimental fall releases of cygnets at traditional fall staging areas. Early indications have shown positive results. This popular public program has experienced successes in the restoration of a species and promotion of wetland values. Sustainable numbers of Trumpeter Swans are now found in several

counties in Iowa. Subsequently, IADNR involvement is being phased down, with a transition of responsibilities to several public and private partners. These are mainly county conservation board staffs and naturalists. The emphasis continues to be Trumpeter Swan restoration and environmental education.

TRUMPETER SWAN RESTORATION IN THE BLACKFOOT WATERSHED OF MONTANA

Elaine Caton, The Blackfoot Challenge, Ovando, MT

Greg Neudecker, U.S. Fish and Wildlife Service, Ovando, MT

ABSTRACT

The Blackfoot Watershed in western Montana encompasses 1.5 million acres with over 30,000 acres of wetlands. In 2003 a pair of Trumpeter Swans (*Cygnus buccinator*) nested in a wetland in the upper watershed, the first record of residency since 1806. A reintroduction project was started in 2005, after an extensive habitat suitability study of the watershed identified 27 potential nesting sites. To date, 213 captive-reared birds (primarily yearlings) have been released. The first territory was established by released birds in 2010, and the number of territories and nests have increased steadily since then. In 2016 there were 10 occupied territories with 8 active nests and 18 fledged cygnets. Additionally, at least one Blackfoot Trumpeter has established a territory in British Columbia. The Blackfoot Challenge, a watershed partnership of landowners, government agencies, and nonprofit organizations, promotes collaboration and has been key to the program's success thus far. Integral aspects of the reintroduction effort include public releases with over 100 students from watershed schools attending; a set of classroom lessons tailored to the project that teachers can use; an online, geospatially referenced database that can be accessed and contributed to by the public; and voluntary efforts by the local power company to mark or bury power lines in sensitive areas.

RESTORATION OF TRUMPETER SWANS ON THE FLATHEAD INDIAN RESERVATION AND ADJACENT ABORIGINAL LANDS IN NORTHWESTERN MONTANA

Dale M. Becker, Tribal Wildlife Management Program, Confederated Salish and Kootenai Tribes, Pablo, MT

Jocelyn L. Aycrigg, University of Idaho, Department of Fish and Wildlife Sciences, University of Idaho, Moscow, ID

ABSTRACT

In an effort to restore extirpated native wildlife to the Flathead Indian Reservation (FIR) and aboriginal lands in western Montana, the Confederated Salish and Kootenai Tribes (CSKT) commenced reintroduction and restoration efforts for Trumpeter Swans in 1996 with a trial reintroduction. Since then, 264 captive-propagated Trumpeter Swans were released on the FIR from 2002 through 2016. By 2004, breeding pairs

had formed and the first production of wild cygnets in possibly 100 years or more fledged from local wetlands. During the intervening years, at least 119 nesting pairs have produced at least 343 fledgling cygnets. Swans from this project have colonized into several wetland habitats throughout northwestern Montana and may soon do the same in southeastern British Columbia. The primary cause of mortality of released swans has been powerline collisions, and lines are regularly marked with flight diverter installations to minimize potential future collisions. Since annual surveys seemed to indicate a healthy, growing population of Trumpeter Swans in northwestern Montana, the CSKT contracted for a population viability analysis with the University of Idaho to assess overall success of the project and the prognosis for the population to continue to thrive. The results of that analysis indicated that, although the population was predicted to have a low likelihood of persistence, the short time span of the data in which adults successfully fledged a brood was increasing (since 1972) was likely a factor in that result. Projecting this analysis into the future, thereby extending the time span of data, indicated that the likelihood of the population persisting was high (approximately 95-96%) over both the short-term (30 years) and the long-term (100 years). As additional population surveys are conducted over the years, the long-term data will better estimate the likelihood of reaching the objectives of long-term sustainability in the future.

STATUS OF TRUMPETER SWANS IN OREGON

Gary L. Ivey, The Trumpeter Swan Society, Bend, OR

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ABSTRACT

Trumpeter Swans (*Cygnus buccinator*) were moved from Red Rock Lakes National Wildlife Refuge (RRLNWR), Montana to Malheur NWR (MNWR), Oregon beginning in 1939, resulting in an established breeding flock at MNWR by the late 1950s. The flock grew until its numbers peaked in the early 1980s at 19 breeding pairs and a total of 77 individuals using the refuge. Because intoduced carp (*Cyprinus carpio*) invaded the MNWR flock's wintering grounds during extreme flooding in the early 1980s and other factors, the flock has precipitously declined to only 2 territorial pairs and less than 12 individuals remain at MNWR. i In order to build a more viable and better distributed Oregon breeding flock, efforts were initiated to increase Trumpeter Swan numbers and expand their breeding and wintering distribution in Oregon. These efforts included moving some Trumpeter Swans from MNWR to Summer Lake Wildlife Area (SLWA), moving swans from RRLNWR to MNWR and SLWA and moving swans from Harriman State Park, Idaho, to SLWA during the years 1991-1996. However, the project was interrupted after 1996 and releases to build a larger breeding flock resumed in 2009 and are continuing. This paper details the current status of the Oregon flock and plans for the future. Additionally, we report on successful redistribution of migrating Trumpeter Swans as numbers using SLWA have significantly increased since the original releases of migrants there.

CONSERVATION OF TRUMPETER SWANS IN EASTERN IDAHO

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ABSTRACT

Most Rocky Mountain Population (RMP) Trumpeter Swans (*Cygnus buccinator)* breed in Canada but there is a small, struggling breeding flock in the Greater Yellowstone Area, which includes Yellowstone National Park, eastern Idaho, southwest Montana, and western Wyoming. In Idaho, Trumpeter Swans are designated a Tier 2 Species of Greatest Conservation Need due to threats to their breeding and wintering habitat. Although Trumpeter Swans breed in relatively low numbers in eastern Idaho, this area provides the most important winter habitat for Trumpeter Swans in the Rocky Mountains. Both Canadian and U.S. Breeding Flocks winter along the region's river corridors and annual midwinter aerial surveys conducted by the U.S. Fish and Wildlife Service reveal that in some years, over 70% of all RMP Trumpeter Swans are wintering in eastern Idaho. Primary threats in Idaho include loss and/or degradation of nesting and wintering habitat from residential development, declining water supplies (e.g., as a result of water use and drought), human disturbance, and powerline collisions. Furthermore, large concentrations of birds that winter in relatively small areas are vulnerable to local habitat changes and stochastic events such as severe winter weather or disease. A multi-organizational trumpeter swan conservation partnership in Idaho is actively working to monitor populations annually, reduce disturbance at breeding sites, maintain and improve suitable breeding habitat on public and private lands, maintain suitable roost and feeding sites at wintering locations, establish a translocation project to increase the breeding population, and mitigate powerline collisions.

HISTORY OF TRUMPETER SWAN RESTORATION IN MINNESOTA

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ABSTRACT

The Trumpeter Swan was extirpated in Minnesota by the 1880s. Hennepin Parks (now Three Rivers Parks) reintroduced swans to the western Twin Cities metro area in the 1960s, but the flock did not grow and expand its range across Minnesota as hoped. The Hennepin Trumpeter Swan project led to the founding of The Trumpeter Swan Society in 1968. With the advent of the Minnesota Department of Natural Resources Nongame Wildlife Program and the state nongame wildlife checkoff on state tax forms, another effort was organized to restore Trumpeter Swans elsewhere in Minnesota in 1982. A total of 50 Trumpeter Swan eggs was collected in Alaska each year in 1986, 1987, and 1988. They were hatched in Minnesota and the cygnets were released at two years of age primarily in northwest Minnesota. Cygnets were also obtained from zoo progeny from the Minnesota Zoo and zoos in Illinois, South Dakota, and Oklahoma.

From initial releases that included about 330 trumpeter swans in the mid-1980s and 1990's, Minnesota's swan population has increased to over 17,000 swans, and Minnesota-origin swans have pioneered into Ontario,

Manitoba, eastern North Dakota and other states. This presentation highlights the successful restoration of Minnesota's trumpeter swans over the past 35 years. One of the key elements of this success story is the successful partnering among conservation organizations and state, federal, and tribal agencies. Among them are Three Rivers Parks, Minnesota DNR Nongame Wildlife Program, US Fish and Wildlife Service, US Forest Service, Heron Lake Game Producers Association, White Earth Indian Band, Dellwood Wildlife Foundation, Minnesota Air National Guard, the Minnesota Zoo and The Trumpeter Swan Society.

CONSERVATION OF PUBLIC LANDS IS IMPORTANT FOR THE CONSERVATION OF WILD TRUMPETER SWANS

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ABSTRACT

The first time I saw wild Trumpeter Swans they were on public land in Grand Teton National Park in Wyoming. At the time, I did not realize how appropriate and significant that was either for the swans or for me. Yellowstone Park was home for the last 69 Trumpeters in the United States. The National Park Service's first Wildlife Chief, George Melendez Wright, loved these swans and he was alarmed to see them being shot at the left the Park for the adjacent Centennial Valley in Montana. So much so that he urged "Ding" Darling to establish that area as a National Wildlife Refuge (NWR), Red Rock Lakes NWR. The first swans and eggs used for Trumpeter restoration in the West and later east of the Rocky Mountains came from there. That is ancient history now, but what about today? Many subsequent swan restoration efforts in the U.S. and Canada utilized public land for releases. This included NWRs like Malheur, Lacreek and Seney. National Parks like Elk Island in Alberta. State Wildlife Areas like Summer Lake in Oregon. County Parks like Hennepin County Parks in Minnesota. The list is long.

Trumpeters Swans currently depend on over 60 NWRs for habitat and sanctuary during some part of their annual cycle. National Forests like the Chugatch in Alaska host nesting Trumpeters. Hundreds of swans winter on the Riverlands Migratory Bird Sanctuary in Missouri, an Army Corps of Engineers location. Saskatoon Island Provincial Park has nesting Trumpeters and host an annual swan festival. Alaska, the heart of the remarkable recovery of Trumpeters is 85% public land. Alaskan public land includes 300 million acre; twice the size of Texas. Almost 88% of NWR acreage is in that state. Less than 11% of Canada is private land; 41% of the public land is Federal Crown Land and 48% is Provincial.

As the human population grows and our impact on the landscape increases public lands will become even more critical to wildlife, fish, plants, clean water and other resources and more critical to the wellbeing of humans. Human use of public lands is quite valuable economically as well. In Fiscal Year 2011, recreational visits to NWR generated $2.4 billion dollars of sales in regional economies and generated about $342.9 million in tax revenue at the local, county, state, and federal level.

I first worked directly with Trumpeter Swans at Malheur NWR. My motivation for this talk was the illegal occupation of that Refuge early this year. A few misguided public officials even supported this action that severely damaged public resources. I dedicate it to the Malheur staff and public land management employees

all over the U.S. and Canada. These lands are our lands and these good people work for us. They deserve our support. Do not take these lands for granted!! Stand up for them!!

TRUMPETER SWAN POPULATION RESPONSE TO MANAGEMENT ON THE KENAI PENINSULA, ALASKA: A HISTORICAL PERSPECTIVE

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ABSTRACT

Aerial surveys of breeding Trumpeter Swans have been conducted annually on the Kenai National Wildlife Refuge (KENWR) and the western Kenai Peninsula in Alaska since 1957. From 1957 through 1984, the known population on KENWR remained at ~ 30 nesting pairs despite a 2-fold increase in swan numbers elsewhere in Alaska. To ameliorate human disturbance, KENWR began protecting lakes used by nesting trumpeter swans from aircraft disturbance in 1985. Additionally, aircraft landings on lakes with late summer broods were prohibited and motorized boats were restricted on part of the Kenai River used by overwintering and spring staging swans. Nesting pairs increased rapidly and steadily after aircraft regulations were put into place; ≤ 75 nesting pairs are currently using KENWR. However, declining mean brood size over this same time interval also suggests that optimum breeding habitat may be saturated. Despite these successes within KENWR, human disturbance on lakes outside refuge boundaries may be hindering the establishment of new pairs elsewhere on the Kenai Peninsula. Available nesting habitat within KENWR has declined because of boundary adjustments associated with two federal laws enacted in 1971 and 1996. The number of nesting pairs has only increased on lakes within KENWR (despite decreased habitat availability) and not on lakes outside KENWR boundaries; most cygnets were produced on territories with little or no human disturbance. Swan nesting habitat in the Kenai Lowlands, particularly on closed-basin lakes, is likely to continue declining in the future because of decreasing available water due to a rapidly warming climate. Other management concerns include renewed interest in aircraft access, increasing levels of recreational use, and declining beaver populations.

HISTORY AND STATUS OF TRUMPETER SWANS NESTING AT TURNBULL NATIONAL WILDLIFE REFUGE IN EASTERN WASHINGTON

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ABSTRACT

Turnbull National Wildlife Refuge, located 20 miles southwest of Spokane, Washington, was one of the reintroduction sites for Trumpeter Swans from Red Rock Lakes NWR in the 1960's. From the original introduction of 33 cygnets, the refuge numbers stayed relatively stable through 1976 with spring populations between 27 and 29 birds. Nesting peaked in 1970 with 8 nest. That was the first year that all introduced birds reached breeding age. Peak recruitment occurred in 1975 with 14 cygnets fledged. In 1976, the supplemental feeding and pond aeration program that began in 1968 was discontinued. This program had effectively created a resident flock with no migration behavior. The resulting dispersal of individuals that first winter and a severe drought the following year resulted in a precipitous decline in the number of swans on the refuge indicating that wintering habitat in the area is severely limiting. By 1980, refuge numbers were reduced to one active breeding pair. In 1988, the female was killed on the nest. The male, dubbed Solo by the local press, remained unattached for 21 years. In 2009, he paired with an unknown swan, nested, and fledged 3 cygnets. He was originally banded in 1984 and he was aged at greater than 4 years old making him at least 29 years old. The pair nested again in 2010, and successfully fledged 5 cygnets. Solo succumbed to suspected lead poisoning in 2011. His mate formed a new pair bond in 2012 and successfully nested in 4 of the last 5 years fledging a total of 12 cygnets. In 2013, another pair of Trumpeters nested successfully on the refuge and they did again this year. This pair potentially includes one of Solo's offspring. Since 2009, the refuge Trumpeters have fledged 24 cygnets. With the recent nesting activity, there has been a renewal of discussions regarding the future management of the growing Turnbull flock. Answers regarding the genetic provenance of this flock and winter movements off-refuge winter are needed to help guide future management.

TRUMPETER SWANS WINTERING IN THE RIVERLANDS MIGRATORY BIRD SANCTUARY IN EASTERN MISSOURI

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ABSTRACT

With the increasing population of Trumpeter Swans in the Mississippi Flyway, similar trends continue to occur at the Riverlands Migratory Bird Sanctuary in West Alton, Missouri. Over wintering populations at Riverlands continue to number larger than a thousand birds, but what once was activity primarily concentrated at the Sanctuary has now expanded into other areas around the region, on and off public lands. We will summarize conservation, monitoring and education efforts on the wintering grounds in both Illinois and Missouri. This will include localized efforts to substantially reduce swan fatalities due to powerline strikes, efforts by The Audubon Center at Riverlands to continue Trumpeter Swan Watch monitoring in

partnership with The Trumpeter Swan Society and summary of the swan's expansion to other areas in the two-state region.

CONSERVATION NEEDS OF TRUMPETER SWANS IN THE WESTERN UNITED STATES

Gary L. Ivey, The Trumpeter Swan Society, Bend, OR

John E. Cornely, The Trumpeter Swan Society, Littleton, Colorado

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ABSTRACT

The Trumpeter Swan Society Board considers the status of the U.S. Flocks of the Rocky Mountain Population of Trumpeter Swans (U.S. RMP) to be of very high concern and among the most important issues facing the future welfare of Trumpeters in North America. The results of the 2015 range wide survey indicate a total of only 765 "white swans". In spite of decades of restoration efforts and management, most of these western U.S. flocks (with few exceptions) have experienced very slow or no growth, are very small in size and remain isolated from other flocks. Such isolation limits natural population growth and population dynamics of a true metapopulation. In order to take a more proactive approach to restoration of Trumpeters in the west, we are proposing working towards building better connectivity between flocks and developing additional sources of swan stocks for releases. Additionally, we recommend that swan managers work towards increasing genetic diversity within flocks for the long-term health and welfare of the U.S. RMP. Genetic diversity is most important during times of rapid environmental change. Trumpeter Swans have the lowest genetic diversity of any waterfowl species studied to date.

LEAD SHOT POISONING OF SWANS WITHIN WHATCOM COUNTY, WASHINGTON AND SUMAS PRAIRIE, BRITISH COLUMBIA: SOURCES, MANAGEMENT AND REMEDIATION

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Paul DeBruyn, Washington Department of Fish and Wildlife, Olympia, WA

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ABSTRACT

At least 2,000 swans in northwest Washington State and on Sumas Prairie, British Columbia have died from poisoning associated with ingestion of lead pellets since 1999. Results of an international investigation (2001-2009) identified Judson Lake (~100 acre lake spanning U.S./Canada border) as a possible source of lead pellets. An adaptive management approach, which involved construction of a large swan exclosure in an area of Judson Lake containing a high density of lead pellets, was implemented by the swan working group to determine if this roost site could be a major source of lead shot. From 2006 to present, lead related swan mortalities declined by 62% in the greater study area of Whatcom, Skagit and Snohomish Counties in Washington State and Sumas Prairie in British Columbia. Average annual mortality prior to exclusion was 231 (2001-2006) compared to 87 during exclusion (2006-2016). However, unusually high lead-caused mortalities occurred during the winters of 2013-2014 (n=176) and 2015-2016 (n=164) and these have raised concerns that swans may be entering the exclusion area at Judson Lake and accessing lead pellets there or there is another major source of pellets within the larger study area.

The swan working group has recommended a three-year project to investigate these two possibilities. The project will require reconstructing the exclosure to ensure proper function and increasing monitoring efforts to document swan incursions. Unusually high lead-caused mortalities during the three-year project (with no incursions in the exclusion area) will indicate another major source of pellets within the larger study area and will require further investigation.

Yellow (*Nuphar polysepala*) and fragrant pond lily (*Nymphaea odorata*) are the predominant aquatic plants in Judson Lake. Extensive woody root systems could be preventing lead pellets from sinking deeper into lake sediment, making them accessible to swans foraging for food and/or grit. Temporary removal of pond lilies from a portion of the lake is anticipated to allow pellets to sink deeper into the sediment.

AUDUBON'S CLIMATE WATCH PROGRAM; HIGHLIGHTING A NEW CITIZEN SCIENCE INITIATIVE THAT CAN HELP MONITOR THE TRUMPETER SWAN IN A CHANGING CLIMATE

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ABSTRACT

Bird species are facing unprecedented rates of change, and many are at risk to lose their current climatic range by the end of the century. In an uncertain future, forecasting how species will respond to climate change is an important conservation tool. Species Distribution Models (SDMs) are often used for this task, however additional targeted data uniquely tailored for species can provide more refined and realistic predictions. Therefore, climate prediction-informed monitoring at a large spatial scale is needed to both improve model predictions and monitor change on the landscape. Audubon's Climate Watch program integrates species climate projections with citizen scientist's knowledge of local habitat to learn how birds will respond to climate change in the near future. Skilled volunteers are recruited and trained by local coordinators, collaborate with Audubon scientists and implement on-the-ground monitoring. For the Trumpeter Swan (*Cygnus buccinator*), Climate Watch could serve as a platform linking climate-informed surveys designed to measure both change and detectability in the landscape with knowledgeable citizen scientists with a deep understanding of the ecology and conservation of this species. An integral component of the program is participant feedback about design of the protocol and logistics, data collection and model predictions which are relayed back to the science team for refinement after each survey period. Feedback and additional data can be used to fine-tune the climate based models for this species, improve the Climate Watch monitoring surveys and efforts, and gathering a more complete picture of the climate change story for Trumpeter Swans.

POSTER ABSTRACTS

EVIDENCE OF A UNIQUE NESTING BEHAVIOR IN TRUMPETER SWANS, *Cygnus buccinators*, IN NEBRASKA.

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Michael Forsberg, Michael Forsberg Photography, Lincoln, NE

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ABSTRACT

Phenology of nesting behavior in Trumpeter Swans Cyg*nus buccinator*, has been well documented for most populations; however, cases of previously undocumented nesting behavior can occur. Trumpeters nest as

early as two years old, but most begin nesting between ages 3-6. Nest territories range from 1.5 to >100 ha, size maybe influenced by shoreline complexity and food availability. They favor large shallow wetlands with a diverse mix of emergent vegetation, open water, and abundant submergent plants (e.g., sago pondweed, *Potamogeton pectinatus*), as forage. Nesting typically occurs from 22 April to 5 May. Nests are often built on solid structures, such as a muskrat house or an island. Both sexes construct the nest, which takes 11-35 days to complete. Nest size can reach a diameter of 1.8-3.6m and a height of 1.5m. Though most Trumpeters nest on stable structures, such as a muskrat house, we found one nest built out of cattail (*Typha angustifolia* L.). The nest structure was unstable, free floating, and shorter than other nest structures encountered throughout the area. To monitor the nest, we placed a Nikon D7000, with a 35 mm wide-angle lens, approximately 10 meters away. The camera was activated every five minutes during daylight hours. Following camera placement, a nest check was conducted five days later, but the nest was gone. During the five days between camera placement and the first nest check, there were multiple days of high winds and a severe thunderstorm. Camera footage confirmed that severe weather, especially high winds, contributed to nest loss. In addition, we observed unique nesting behavior where both adults attempted to rescue the nest. From the time the nest began to sink, the adult pair worked continuously to rebuild it. Unfortunately, they were unable to salvage the nest despite their effort. Camera evidence confirmed that when the nest took on water both adults reacted by building the nest up to attempt to avoid nest loss. Previous research in other species of waterfowl (e.g., Redhead, *Aythya americana*) has shown that waterfowl build up nests in response to rising water levels, but to our knowledge this is the first time this behavior has been documented in Trumpeter Swans.

ADAPTIVE MANAGEMENT STRATEGIES TO REDUCE HUMAN IMPACTS ON TRUMPETER SWANS (*Cygnus buccinator*) IN YELLOWSTONE NATIONAL PARK

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ABSTRACT

Rocky Mountain Trumpeter Swans (*Cygnus buccinator*) were first documented in Yellowstone National Park (YNP) in 1919 and were considered (with nearby Centennial Valley, later Red Rocks Lake National Wildlife Refuge) the last population of trumpeter swans in the continental United States. The YNP flock increased through the mid-20th century, but declined thereafter with the steepest decrease from the early 1990s through the present. By 2016, only two territorial pairs resided within YNP. Reasons for the decline are unknown, but are likely due to several non-mutually exclusive possibilities: long-term habitat change, human disturbance, changes in management outside YNP, and predation. Concerns over possible extirpation caused YNP to take management action. Adaptive management actions include: installing a nest platform for suitable breeding

habitat, grafting genetically unrelated cygnets to resident wild swans, introducing swans to historically productive areas, and keeping sensitive breeding habitat closed to human use during crucial young-rearing periods. These strategies are implemented to increase genetic diversity, productivity, recruitment, and established territories. The goals of these actions are to protect and increase swan breeding opportunities while still providing a high quality visitor experience. Should these efforts fail, then YNP may no longer be considered suitable swan habitat. Alternatively, or perhaps in addition, YNP's swans may be augmented by dispersal from outside areas which has possibly declined through time. Examining the success of these adaptive management strategies provides insight into the conservation of long-lived species with slow reproduction throughout many taxa.

DISTRIBUTION AND ABUNDANCE OF SWANS DURING THE SPRING LIGHT GOOSE HUNT IN SOUTHEAST IDAHO.

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ABSTRACT

Trumpeter Swans (*Cygnus buccinator)* are a Tier 2 Species of Greatest Conservation Need in Idaho and have conservation concerns associated with both wintering and nesting populations. Trumpeter Swan conservation efforts to date have included actions to successfully expand wintering distribution outside of the Core Tri-State Area by moving cygnets into expansion areas around eastern Idaho. The Idaho Department of Fish and Game (IDFG) has participated in these important and effective conservation efforts that have expanded the distribution of wintering swans from the upper Henry's Fork River to riverine/agricultural valleys throughout eastern Idaho. Distribution and abundance of Trumpeter Swans have been monitored in the Fort Hall Bottoms and around American Falls Reservoir since the establishment of a Spring Light Goose Hunt in 2010. Due to annual increases in numbers of swans in the area, there was concern of potential impacts of the Spring Light Goose Hunt on continued trumpeter swan conservation. In 2015, we continued monitoring distribution and abundance of Trumpeter Swans to assess any possible impacts from the Spring Light Goose Hunt. We documented distribution and abundance of swans in agricultural fields by observing and counting all swans along a standardized, 250-mile route, 3 days per week during the pre-hunt (31 January – 13 February), hunt (14 February – 10 March), and post-hunt (11 March – 24 March) survey periods in 2015. Distribution of swans in agricultural fields during the 2015 survey was generally similar during the pre-hunt, hunt, and post-hunt survey periods. Abundance of swans fluctuated dramatically across survey periods and may have been due to mild conditions, which allowed ample access to open water and may have triggered an earlier migration. A comparison of the surveys conducted in 2010, 2011, 2012, and 2015 showed no discernible interactions between swan distribution and hunting activities. After 4 years of monitoring, there is no definitive evidence indicating that swans are disturbed and displaced by hunting pressure and therefore the requirement by the Pacific Flyway Council to monitor swans during the Spring Light Goose Hunt every 3rd year has been removed.

NEST/EGG TEMPERATURES IN RELATION TO TRUMPETER SWAN (*Cygnus buccinator*) CYGNET SURVIVORSHIP IN THE YELLOWSTONE ECOSYSTEM

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ABSTRACT

Trumpeter Swans (*Cygnus buccinator*) were once widely distributed throughout North America. Population declines during the 19th and 20th Centuries were due to overhunting and habitat loss. By the 20th Century 69 swans were found in the Yellowstone Ecosystem. Although conservation efforts continued through the 20th Century cygnet survivorship in the Yellowstone Flock declined due to food limitation, weather, diseases, abnormalities, emaciation, predation, and parasites. Our objectives were to: (1) determine fertility rates for eggs in swan nests at Grays Lake National Wildlife Refuge (Yellowstone Ecosystem) and (2) quantify their nest/egg incubation temperatures. We placed 4 artificial eggs (with temperature data loggers) in 4 trumpeter nests during 2015 breeding season. Of these, we found differences among nests in average number of incubation recesses, average length of recesses, and average egg temperature fluctuation. We hypothesize these differences may significantly affect a cygnets' subsequent survival probability during the 3-month post-hatch rearing season.