Sea Duck Joint Venture Implementation Plan 2017-2019

North American Waterfowl Management Plan

Plan nord-américain de gestion de la sauvagine

Plan de Manejo de Aves Acuáticas de Norteamérica

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Drake Common Goldeneye; Tim Bowman

Sea Duck Joint Venture
Implementation Plan

January 2017 through December 2019

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OBJECTIVE

The objective of the Sea Duck Joint Venture (SDJV) Implementation Plan is to describe current SDJV priorities, identify deliverables, set out time lines, and identify the individual(s) responsible for implementation of priority tasks outlined in the SDJV Strategic Plan over the period January 2017 through December 2019. The Implementation Plan also reports on progress toward addressing tasks during the previous two years. The 3-year Implementation Plan is a living document that is revisited annually and revised to reflect changing SDJV priorities, mandates, and progress toward objectives. This document revises the plan written in 2016.

INTRODUCTION

This Implementation Plan steps down the SDJV 2014-2018 Strategic Plan, providing more specific direction and priorities over a shorter, 3-year, time frame. It is intended to be a flexible, dynamic document that is reviewed and revised annually to reflect progress toward addressing science priorities and adapted to address new initiatives.

The Implementation Plan is reviewed each year by the SDJV Continental Technical Team (CTT) at their annual fall meeting. The CTT makes preliminary recommendations for revisions to the Plan and presents them to the Management Board during the joint CTT-Management Board fall meeting. A subcommittee, composed of SDJV Coordinators, CTT and Management Board co-chairs drafts a revision to present to the Management Board prior to a spring teleconference.

PRIORITIES 2017 – 2019

Priorities set out in this Implementation Plan are designed to help meet the SDJV mission, which is to "…promote the conservation of all North American sea ducks through partnerships by providing greater knowledge and understanding for effective management." The 2014-2018 strategic plan reflects a significant shift in focus for the SDJV, from a broad-based science program to a more focused program intended to provide information most needed by managers to make informed decisions. The strategic plan identifies the SDJV's highest priorities as: 1) estimate parameters needed to manage and ensure sustainability of sea duck harvest, 2) better understand habitat use and needs, and 3) ensure that the SDJV maximizes learning from research that has already been done. The plan also prioritizes among species; the highest priority species are surf scoter, black scoter, white-winged scoter, long-tailed duck, and American common eider.

A summary of recent accomplishments and tasks for the next three years are described below for SDJV science initiatives as well as for administrative, outreach, and communication programs.

POPULATION DELINEATION

At the inception of the SDJV, the lack of understanding about population delineation was seen as one of the highest priority topics for future work. Identifying links among breeding, molting, staging, and wintering areas will help improve the design of monitoring surveys and interpretation of trends, and more effectively direct management actions including harvest management. Many SDJV partners have used satellite telemetry to document migration patterns of sea ducks and determining temporal and spatial linkages throughout the annual cycle. Satellite telemetry also yields a wealth of data on seasonal site and habitat use, thus informing habitat conservation efforts. Genetics and stable isotopes have also provided insights into how populations are structured, and multiple complementary approaches (satellite telemetry, genetics, isotopes, banding) may provide the best portrayal of population delineation. An ongoing analysis of PTT data and sample size requirements, scheduled for completion in 2017, should provide some insights into sample size requirements for satellite telemetry studies.

During the fall SDJV meeting in November 2016, the CTT reviewed current knowledge of population delineation for all sea duck species, based on multiple techniques, and idenfied the following priorities for 2017 and possibly beyond: 1) Continue with genetics analyses for all three scoter species and American common eider; 2) further investigate methods to delineate long-tailed ducks rangewide – this was viewed as the most uncertain of all priority sea duck species and considered the highest priority gap. One specific task was to seek additional genetics samples for long-tailed ducks from eastern North America; 3) based on analyses from satellite telemetry studies and the results of the sample size requirements study, continue using satellite telemetry to characterize annual movement patterns, winter habitat use, and breeding locations, and strive to reach recommended sample sizes for appropriate cohorts of key species in North America.

There is also high interest in compiling, archiving, and providing access to, available data from satellite telemetry studies to better inform conservation and planning efforts. Initial discussions with USGS BISON (Biodiversity Information Serving Our Nation) and USGS Patuxent Wildlife Research Center suggest that a telemetry data platform capable of accomplishing this is possible by leveraging existing staff resources and IT systems, and efforts are underway for a pilot project using data from the Atlantic and Great Lakes Sea Duck Migration Study.

ACCOMPLISHMENTS: 2015-2016

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES	OUTCOME:
Compile progress report on cumulative results from Atlantic and Great Lakes Sea Duck Migration Study	Check progress; identify remaining gaps and need for re-direction	Tim Bowman in concert with PIs and database manager	Annually, or as new results dictate	Last report completed June 2015
Update telemetry database for Atlantic and Great Lakes Study	Availability of most current research results	Database and mapping coordinator	Annually	Ongoing via contractor: Biodiversity Research Institute
Conduct analyses of PTT sample size requirements using hypothetical data and existing data sets	Guidance on effort required for all satellite telemetry studies	Contracted via Pacific Wildlife Foundation, BC	Expected completion in 2017	Expected completion in 2017.

Mark surf scoters with PTTs in Douglas Channel (Kitimat), BC	Delineation of Pacific Scoter populations	Boyd, WS	Marking done in April 2014. Report completed by 2016.	Annual progress report posted on SDJV web site
Mark white-winged scoters with PTTs on Atlantic coastal wintering areas and molting areas	Delineation of Atlantic-wintering WWSC; characterize habitat use	Lucas Savoy, BRI, and Univ. Rhode Island	Annual progress reports by Sept 28	In 2014, marked 3 adult female WWSC; in November 2015, marked 22 adult female WWSC. Marked 26 on molting areas in Quebec August 2016
Mark long-tailed ducks with PTTs on Atlantic coastal wintering areas	Delineation of Atlantic-wintering LTDU; characterize habitat use	Lucas Savoy, BRI, and Univ. Rhode Island	Annual progress reports by Sept 28	In November-December 2015, marked 15 adult female LTDU; marked 22 in December 2016
Mark long-tailed ducks with PTTs on Lake Michigan	Characterize delineation, habitat use, and migration patterns for LTDU wintering in upper Great Lakes	Kevin Kenow, USGS	Annual progress reports by Sept 28	Limited success in marking birds in winter 2015-2016; attempting captures again during winter 2016-2017
Mark Pacific black scoters with PTTs on spring staging areas on Alaska Peninsula	Delineation of Pacific black scoters from key wintering area	Alaska Dept Fish and Game	Annual progress reports by Sept 28	11 adult females marked at Nelson Lagoon, spring 2015 and 2016
Synthesize available information about population delineation for all sea duck species	Identify remaining gaps; ensure results of studies are available	Various	Workshop at fall 2016 SDJV meeting	Presented draft summary during workshop at fall 2016 SDJV meeting; synthesis is continuing in 2017
Collection of feather samples from Parts Collection Surveys in U.S. and Canada	Establish a feather sample set that can be used for stable isotope and genetic analyses to characterize population delineation	Tim Bowman (isotopes), Sarah Sonsthagen (genetics)	Collection of feathers at all 4 U.S. flyway wing bees and Canadian wing bee	Have collected samples for all species for 3 hunting seasons; working to achieve target sample sizes for low-harvested species

WORK PLAN (2017-2019): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
Advise agencies, JV's etc., responsible for habitat conservation and harvest management about results of satellite tracking studies	Protection of important areas; more informed decisions about harvest management	SDJV U.S. Coordinator and flyway reps on CTT	Recurring activity accomplished through posted reports,executive summaries, and flyway meetings
Re-evaluate progress and design of	Evaluate original study	CTT	Review after completion

Atlantic and Great Lakes study after completion of 2016 trapping sessions; develop strategy to address remaining priority gaps	design to ensure goals are being met in most cost effective way.		of each field season (dates will vary among years) and analysis of sample size requirements
Compile annual report on cumulative results and data from Atlantic and Great Lakes Sea Duck Migration Study	Provide information to partners and stakeholders; identify remaining gaps and need for re-direction	Tim Bowman in concert with PIs and database manager	Last report completed and posted June 2015, next report as new results dictate
Update telemetry database for Atlantic and Great Lakes Study	Availability of most current research results	Database and mapping coordinator	Ongoing via contractor BRI
Collect feather samples fom harvested birds via parts collection surveys in U.S. and Canada	Obtain tissues needed for isotopic and/or genetic analyses	Sarah Sonsthagen, Tim Bowman	Continue sampling until sample size goals have been met for all species; begin pilot analyses opportunistically and through RFP

WORK PLAN (2017-2019): Unique In-Year Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
2017			
Conduct analyses of PTT sample size requirements using hypothetical data and existing data sets	Guidance on marking effort required for all satellite telemetry studies	Contract via Pacific Wildlife Foundation, BC	Expected completion in 2017.
Complete satellite telemetry study of white-winged scoters and long-tailed ducks along southern New England coast	Work to fill gaps for delineation of high priority species	University of Rhode Island	Continue tracking birds marked in 2015 and 2016
Investigate delineation of Pacific Barrow's goldeneye populations using genetic markers	ID population structure and complement sat telemetry results with another technique	Sarah Sonsthagen, USGS Alaska Science Center	Complete analyses and submit progress report by Sept 28, 2017
Satellite telemetry of surf and white-winged Scoters in Alaska	Work to fill gaps for Pacific scoters - population delineation and habitat use	Alaska Dept Fish and Game	Captures planned for March-April 2017; progress report by Sept 28, 2017
Mark adult female LTDU wintering in Lake Michigan	Work to fill gaps for Great Lakes LTDU	USGS Midwest Research Center, Kevin Kenow	Captures planned Feb-April 2017; progress report by Sept 28, 2017
Archive individual project telemetry data in Movebank and make available on new access and visualization platform. Provide summaries of satellite telemetry data publically through USGS BISON project (Biodiversity Infromation Serving Our	Ensure information from Atlantic and Great Lakes Sea Duck Migration Study is available to inform	Emily Silverman, USFWS, and Derek Masaki, USGS	Archive as many telemetry data sets as possible, and test pilot project using Atlantic and Great Lakes project data internally,

Nation)	conservation efforts		by end of 2017.
Characterize population structure and havest composition of Am common eider	Improve ability to manage Am COEI at appropriate scale	PIs are Chris Dwyer, USFWS, Sarah Sonsthagen, USGS and Scott Gilliland, CWS	Progress report by Sept 28, 2017
Collection of feather samples from Parts Collection Surveys in U.S. and Canada	Establish a feather sample set that can be used for stable isotope and genetic analyses to characterize population delineation	Tim Bowman (isotopes), Sarah Sonsthagen (genetics)	Coordinate sampling at all wing bees during winter 2017. Stop collecting for species-cohorts once target sample size is attained.
2018			
Satellite telemetry of surf scoter and white-winged scoters in Alaska	Work to fill geographic gaps and increase sample size for Pacific scoters	Alaska Dept Fish and Game	Captures planned for April 2018; progress report by Sept 28, 2018
Investigate husbandry techniques to improve survival rates of sea ducks implanted with PTTs (esp. SUSC and LTDU)	Increase survival and effective PTT sample sizes; address concerns about animal welfare.	TBD, possibly via RFP	TBD.
Characterize population structure and havest composition of Am common eider	Improve ability to manage Am COEI at appropriate scale	PIs are Chris Dwyer , USFWS, Sarah Sonsthagen, USGS and Scott Gilliland	Progress report by Sept 28, 2018
Collection of feather samples from Parts Collection Surveys in U.S. and Canada	Establish a feather sample set that can be used for stable isotope and genetic analyses to characterize population delineation	Tim Bowman (isotopes), Sarah Sonsthagen (genetics)	Coordinate sampling at all wing bees during winter 2017. Stop collecting for species-cohorts once target sample size is attained.
2019			
Characterize population structure and havest composition of Am common eider	Improve ability to manage Am COEI at appropriate scale	PIs are Chris Dwyer , USFWS, Sarah Sonsthagen, USGS and Scott Gilliland	Progress report by Sept 28, 2019

MONITORING

The SDJV has emphasized the importance of documenting the distribution and relative abundance of sea duck populations as a precursor to establishing population objectives,

determining population trends, predicting potential effects of threats, evaluating responses to climate change, and evaluating the effects of management actions including harvest. Monitoring for many sea duck species remains inadequate for these purposes. The SDJV has so far focused on developing and testing alternative survey methodology, with the expectation that once developed, surveys would be administered by wildlife agencies in the U.S. and Canada – an expectation that has not materialized due largely to tightening budgets.

The priorities of the SDJV have been to develop programs to monitor long-term trend, abundance and distribution of sea ducks:

- at a sufficiently large geographic scale to permit detection of broad-scale changes in distribution or densities that may result from habitat changes, such as those induced by climate change.
- for manageable discrete population units that may be subject to specific threats, and for which conservation actions could be taken and evaluated.
- cost-effectively, while providing the greatest possible confidence in the survey results.
- to provide information on distribution and abundance to developers so that they can reduce or mitigate their effects on sea duck populations (e.g. new and expanded offshore wind, tidal, and oil energy development).
- to provide managers with information needed for harvest and habitat management.

In fall 2015, the CTT was tasked with reviewing the 2007 SDJV report *Recommendations for Monitoring North American Sea Ducks* (http://seaduckjv.org/wp-content/uploads/2015/01/sea_duck_monitoring_report_web1.pdf) and developing a revised monitoring strategy. In 2016, the Monitoring Subcommittee began a review of surveys described in the 2007 report, rating each survey on its ability to address information needs for harvest, habitat conservation, and status and trends, for a suite of high priority species. During 2017, the subcommittee will develop a new general sea duck monitoring strategy that builds on the 2007 report and incorporates information from surveys or studies done since that report was written. The Monitoring Subcommittee is currently chaired by Anthony Roberts (USFWS) and includes Emily Silverman (USFWS), David Safine (USFWS), Tim Bowman (USFWS), Kyle Spragens (WDFW), Eric Reed (CWS), Shannon Badzinski (CWS), and Scott Gilliland (CWS), with Management Board input from Chris Dwyer (USFWS) and Jay Osenkowski (RI DEM).

ACCOMPLISHMENTS: 2015-2106

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES	OUTCOME
Conduct a reconnaissance survey of the Barrenlands area west of Hudson Bay	Determine distribution and relative densities of sea ducks and other waterfowl	USFWS (Walt Rhodes lead)	Expect report February 2016	Survey was completed in 2014 and expanded in 2015. Info is being used to inform review

				and possible re-design of WBPHS
Conduct Pacific common eider breeding surveys in central arctic Canada	Determine relative densities, estimates, for comparison with historical data	CWS	Survey June 2015 and 2016; Progress reports end of September	Survey conducted in 2014-2016. Progress report posted on SDJV web site
Complete Sea Duck Aerial Detection Rate study	Enable scaling of abundance indices to actual abundance	USFWS, Washington Dept Fish and Wildlife	Prelim summary for NADS 2016, uncertain after that	Preliminary data analysis completed, presented at sea duck conference in Iceland and at NADS 2016. Analyses ongoing
Evaluate "crowdsourcing" methods to assist with processing and analyses of aerial photographic data sets	Part of study to estimate aerial detection rates	Emily Silverman, USFWS	Progress report end of August 2015 and story for spring 2016 SDJV newsletter	Project is ongoing; progress report posted on SDJV web site; article in SDJV newsletter spring 2016
Pacific winter sea duck survey	Document distribution and relative abundance at coarse scale	USFWS (Walt Rhodes lead)	Reconnaisance conducted in northern BC during 2015 to evaluate feasibility	Risk assessment
Conduct Eider Spring Migration Survey at Point Barrow, Alaska	Estimate numbers of COEI and KIEI for northern Alaska and western Canada	Wildlife Conservation Society, North Slope Borough	Survey April-June 2015 and 2016; Progress report end of August 2016	Progress report with prelim results posted on SDJV web site
Support review of Waterfowl Breeding Population and Habitat Survey	Support the WBPHS review by organizing relevant information; consider changes to coverage or methods to improve sea duck monitoring	USFWS, Migratory Bird Management	Hire data analyst in 2016 to work on metadata, shapefiles, data checking.	Provided $12K funding to USFWS. Student contractor hired; progress made and still working on it

WORK PLAN (2017-2019): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
Periodically evaluate species	Provide information to guide	CTT monitoring	Periodically

population objectives for validity, and determine whether any new species could have objectives determined	conservation of sea ducks at smallest scale possible	and population objectives subcommittees	

WORK PLAN (2017-2019): Unique In-Year Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
2017			
Review current status of sea duck surveys and methodology and recommend general monitoring strategy for next 3+ years	Ensure monitoring meets the needs of waterfowl managers	Monitoring subcommmittee, CTT and others as appropriate	Recommendations report completed prior to fall 2017 meeting
Evaluate “crowdsourcing” methods to assist with processing and analyses of aerial photographic data sets	Part of study to estimate aerial detection rates	Emily Silverman, USFWS	Build internal site for review; have working prototype for DOI photo review by end of 2017
Initiate scoter detection and species ID study in Canada	Develop techniques to estimate detection, mis-identificaiton rates; provide support for WBPHS review	Eric Reed, CWS, is PI for this project	Progress report due Sept 28, 2017
Determine info needs for population monitoring and management of Great Lakes wintering sea ducks	Bring together stakeholders, compile existing data, ID needs	Dr. Jake Straub, Univ Wisconsin is PI for this project.	Synposium planned spring 2017. Progress report due Sept 28, 2017
Investigate techniques for automated detection, counting, and identification of sea ducks using aerial imagery and machine learning processes.	Improve efficiency and reduce safety risk associated with manned low-level aerial surveys	Mark Koneff, USFWS	Progress report due Sept 28, 2017
2018			
Second year of scoter detection and species ID study in Canada	Develop techniques to estimate detection, mis-identificaiton rates; provide support for WBPHS review	Eric Reed, CWS, is PI for this project	Progress report due Sept 28, 2018
Complete project to identify info needs	Bring together	Dr. Jake Straub, Univ	Technical

for population monitoring and management of Great Lakes wintering sea ducks	stakeholders, compile existing data, ID needs	Wisconsin is PI for this project.	document and publication by Jan 2018; Progress report due Sept 28, 2018
2019			
Third year of scoter detection and species ID study in Canada	Develop techniques to estimate detection, mis-identificaiton rates; provide support for WBPHS review	Eric Reed, CWS, is PI for this project	Progress report due Sept 28, 2019

HARVEST MANAGEMENT

To help address the needs of decision-makers, a Harvest Management Subcommittee was established in 2011. CTT members on the Harvest Management Subcommittee include: Chris Dwyer (USFWS, chair), Jay Osenkowski (RI DF&W), Dan McAuley (USGS, PWRC), Scott Gilliland (CWS), Grant Gilchrist (EC, NWRC), Eric Taylor (USFWS), Emily Silverman (USFWS), and Nic McLellan (DU Canada). Additional members of the subcommittee from the harvest management community include: Randy Milton (NS DNR), Brad Allen (ME IF&W), Kelsey Sullivan (ME IF&W), Mark Koneff (USFWS), Eric Reed (CWS), Paul Padding (USFWS), Kathy Fleming (USFWS), Ken Richkus (USFWS), Barb Avers (MI DNR), Jim Kelley (USFWS), Guthrie Zimmerman (USFWS), Steve Olson (USFWS), Todd Sanders (USFWS) and Andre Breault (CWS). The purpose of this subcommittee is to: 1) engage the harvest management community (sport and subsistence) to estimate the harvest potential of priority sea duck populations and, 2) determine the priority information needed to support harvest management decision–making that the SDJV can address through focused research and/or monitoring program development. Priority populations include black, surf and white-winged scoters, American common eiders and long-tailed ducks. The geographic scope includes the Atlantic, Mississippi and Pacific Flyways. The subcommittee was intended to provide support to, and work through, existing harvest management processes through the Flyway Councils and the Harvest Management Working Group rather than to provide independent recommendations and actions regarding sea duck harvest management.

A report authored by Koneff et al., *Implications of Demographic Uncertainty for Harvest Management of North American Sea Ducks*, was released for review by SDJV and flyway representatives, and others, in March 2016. The report highlighted the uncertainties in model parameters and identified parameters for which higher accuracy and precision would most improve the models. The report was endorsed by the SDJV Management Board as a first step in identifying research and monitoring needs for the SDJV in the context of better informing harvest management decisions.

ACCOMPLISHMENTS: 2015-2016

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION	OUTCOME

			DATES	
Identify priority actions and next steps in harvest management assessment	Inform sea duck harvest management decision-making community	Harvest Management Subcommittee	Report to CTT and MB on the prospectus, priority actions and proposed timelines during fall meetings	Completed
Compile relevant demographic and survey information to use in conducting an assessment of the harvest potential of scoters, long-tailed ducks and American common eiders	Inform sea duck harvest management decision-making community	Harvest Management Subcommittee	Report to CTT, MB, relevant flyway technical committees and the Harvest Management Working Group on progress and results	Completed
Conduct an expert elicitation process to review demographic and survey information being used, and obtain input on parameter uncertainty values among sea duck experts	Inform sea duck harvest management decision-making community	Harvest Management Subcommittee	Expert opinion received and incorporated into the final modelling effort by March, 2015	Completed
Complete report:*Implications of Demographic Uncertainty for Harvest Management of NA Sea Ducks*	Inform sea duck harvest management decision-making community	Harvest Management Subcommittee	March 2016	Completed
Develop web page on Harvest Assessment of sea ducks	Provide objective information to stakeholders	Tim Bowman	December 2016	Completed
Collection of feather samples from Parts Collection Surveys in U.S. and Canada	Establish a feather sample set that can be used for stable isotope and genetic analyses to characterize harvest	Tim Bowman (isotopes), Sarah Sonsthagen (genetics)	Collection of feathers at all 4 U.S. flyway wing bees and Canadian wing bee	Have collected samples for all species for 3 hunting seasons; working to achieve target sample sizes for low-harvested species

WORK PLAN (2016-2018): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
As monitoring programs are established or improved, continue to work with the harvest management community to evaluate whether species population objectives are warranted.	Provide information to managers to guide conservation of sea ducks at smallest scale possible	CTT Population Objectives subcommittee	As needed and during continued evaluation of progress toward filling high priority information gaps.
Support the communication needs of	Sea duck harvest management decision-	Harvest Management	Provide information as needed to support agency

the harvest management community as needed	making community, sea duck hunters/guides and the interested public.	Subcommittee	outreach for management decisions made based on the science, and as described in the SDJV Communications Plan
Update web page on Harvest Assessment of sea ducks	Provide objective information to stakeholders	Tim Bowman	As needed
Improve estimates of harvest for Am. Common Eider using genetics techniques to discriminate among geographic areas in the Species Composition Survey (parts collection)	Inform efforts to manage harvest of Am Common Eider	USGS Alaska Science Center and USFWS Region 5	First progress report end of September 2017

WORK PLAN (2017-2019): Unique In-Year Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
2017			
Conduct an *Expected Value of Information* analysis for the harvest assessment	Provide guidance to researchers and managers on what information is most important	Harvest Management Subcommittee; authors of harvest assessment report	Complete analysis and distribute draft report to SDJV CTT and Mgt Board by October 1, 2017
Make recommendations for addressing information needs/priorities through the SDJV RFP process or other funding initiatives	Determine feasibility and capacity for the SDJV to address information needs. Researchers, universities, agencies are made aware of priority information needs relative to managing harvest of sea ducks	Harvest Management Subcommittee	Develop a plan for integration, costs and timelines into the research and monitoring plan updates, and the Implementation Plan
Collection of feather samples from Parts Collection Surveys in U.S. and Canada	Establish a feather sample set that can be used for stable isotope and genetic analyses to characterize harvest	Tim Bowman (isotopes), Sarah Sonsthagen (genetics)	Coordinate sampling at all wing bees during winter 2017. Stop collecting for species-cohorts once target sample size is attained.
2018			
Collection of feather samples from Parts Collection Surveys in U.S. and Canada	Establish a feather sample set that can be used for stable isotope and genetic analyses to characterize harvest	Tim Bowman (isotopes), Sarah Sonsthagen (genetics)	Coordinate sampling at all wing bees during winter 2017. Stop collecting for species-cohorts once target sample size is attained.

HABITAT CONSERVATION

While the SDJV partnership has made progress in understanding where important sea duck habitats are, what times of the year they are used and for how long, and what proportion of certain populations use those areas, information on seasonal habitat use and abundance has not yet been consolidated into a centralized database that is easily accessible to waterfowl managers, habitat conservationists, and industries that need this information to prioritize sea duck habitat management. In 2013, a Sea Duck Habitat Management and Conservation Subcommittee was formed to lay out a strategy to better address habitat needs and identify priority actions for North American sea ducks. The Habitat Management and Conservation Subcommittee includes CTT members Nic McClellan (DUC, chair), Tim Bowman (USFWS), Sean Boyd (EC S&T), Shannon Badzinski (CWS), Chris Dwyer (USFWS), Christine Lepage (CWS), Anthony Roberts (USFWS), and Management Board members Tom Rothe (PBJV) and Marc Wimer (USGS). In addition, other representatives from Habitat Joint Ventures will be engaged to determine information needs of the habitat Joint Ventures and habitat management communities as well as to identify opportunities whereby the SDJV may inform or influence land use and other policy issues.

The Habitat Management and Conservation Subcommittee is working on a three-step process: 1) develop a static "Key Sites" atlas that delineates and describes the most important sea duck areas in North America, 2) engage a data-serving entity to ensure that sea duck geospatial data are available in a web-based queryable system, and 3) encourage studies to determine what makes habitats important to sea ducks and whether certain habitats are limiting populations of sea ducks.

ACCOMPLISHMENTS: 2015-2016

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES	OUTCOME
Begin development of a sea duck "key sites" atlas	Make readily available static maps that provide planners information on areas most important to sea ducks including seasonal importance	Habitat Management & Conservation Subcommittee	Initial workshop was held at fall 2014 CTT meeting, with subsequent updates at most CTT and Mgt Board meetings	Contractor hired to lead GIS mapping efforts; data currently being compiled and reviewed by area experts; about 30 key sites have a site description
Identify existing data sources that can be used to better inform habitat conservation and protection efforts; characterize strengths and limitations of available data sets	Ensure best available science is made available to habitat conservationists, industry, and marine spatial planners	Habitat Management & Conservation Subcommittee	Initial list of survey and satellite telemetry data sources and contacts compiled by September 2016	List of sea duck data sources provided to USGS BISON team
Identify existing data providers that could	Ensure best available science	Habitat Management	Identify potential data providers by fall	Discussion at fall 2016 SDJV

potentially host sea duck geospatial data	is made available to habitat conservationists, industry, and marine spatial planners	& Conservation Subcommittee	2016 SDJV meeting	meeting suggested that USGS BISON could serve this role for survey data and possibly satellite telemetry data. Workshop on satellite telemetry data held at 6th Intl Sea Duck Conference. Feb 2017

WORK PLAN (2017-2019): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
Review strategy and timeline for addressing information needs relative to habitat conservation	Ensure that SDJV is working towards obtaining information needed by the sea duck habitat conservation and policy development communities	Habitat Management & Conservation Subcommittee	Report to CTT and MB on progress, priority actions and proposed timelines - reviewed annually
Revise Key Habitat sites atlas as new information becomes available	Make readily available static maps and site narratives that provide planners with information on areas most important to sea ducks including seasonal importance	Habitat Management & Conservation Subcommittee	Ongoing
Send annual SDJV newsletter and periodic targeted communications to coastal and Great Lakes habitat JVs	Keep habitat JVs informed of SDJV research and monitoring; engage habitat JVs in sea duck habitat conservation	Habitat Management & Conservation Subcommittee	Annual report in spring. Update on Key Sites and geospatial database efforts as they develop

WORK PLAN (2017-2019): Unique In-Year Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
2017			
Continue to develop a sea duck “key sites” atlas	Make readily available static maps and site narratives that provide planners with information on areas most important to sea ducks including seasonal importance	Habitat Management & Conservation Subcommittee	Strive to complete at least 50 key site narratives, complete reviews by area experts, and make available online via SDJV web site by end of 2017. Contract out writing tasks as funds permit.
Engage USGS BISON program or other	Provide accessibility to geo-referenced information	Habitat Management &	By September 2017, provide demonstration of

organizations that have the skills and capacity to integrate sea duck data into a geospatial database	already collected and provide links to LCCs, Habitat Joint Ventures, and other audiences	Conservation Subcommittee	USGS BISON capabilities and user interface.
Include a sea duck key site habitat atlas update at 6th Intl Sea Duck Conference	Inform conservation community about SDJV efforts to map sea duck "key sites" and intent to develop geospatial database of sea duck distribution and abundance data	Habitat Management & Conservation Subcommittee	Poster presented at 6th Intl Sea Duck Conference, February 2017
2018			
Publication of a sea duck "key sites" atlas	Make readily available static maps that provide planners information on areas most important to sea ducks including seasaonal importance	Habitat Management & Conservation Subcommittee	Maps are reviewed and site narratives are written by experts and posted on SDJV web site as they are completed. Completion by May 2018
Work with USGS BISON program or other organizations to ensure relevant sea duck data are integrated into a geospatial database	Provide accessibility to geo-referenced information already collected and provide links to LCCs, Habitat Joint Ventures, and other audiences	Habitat Management & Conservation Subcommittee	By September 2018, provide updated demonstration of USGS BISON capabilities and user interface.
2019			
Revisions for sea duck "key sites" atlas	Make readily available static maps that provide planners information on areas most important to sea ducks including seasaonal importance	Habitat Management & Conservation Subcommittee	Maps and/or site narratives are revised by experts based on new information and re-posted on SDJV web site

OTHER RESEARCH

To support the science needed to meet the objectives of the SDJV, the U.S. Fish and Wildlife Service has made available funds to support research on behalf of the SDJV. From 2002 to 2010, the SDJV annually issued a Request for Proposals (RFP) that solicited research addressing a broad array of information needs described in the SDJV Strategic Plan. This process resulted in significant advances in our understanding about sea duck migration patterns, habitat use, biology, and ecology. Beginning in 2011, the SDJV focused on a smaller set of topics and discontinued the RFP, but recognized that many other knowledge gaps remained that may help identify limiting factors for sea ducks. An RFP was again issued for 2016 and 2017 that addressed a small set of high priority topics.

During the time frame of this implementation plan, we anticipate that much of the SDJV funding will be directed to the priority topics of harvest management and habitat conservation, including studies of population delineation and monitoring that support those topics and provide requisite baseline information. To the extent possible with limited funding, the CTT and Management Board would also like to make funding available for broader research that addresses priorities of the SDJV, capitalizes on opportunities offered by partners, and further leverages SDJV funds. We anticipate that there will not be a

competitive request for proposals for FY2018 because multi-year projects funded in FY2017 will tie up most funds into FY2018 as well.

ACCOMPLISHMENTS: 2015-2016

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES	OUTCOME
Revise Implementation Plan to reflect current research priorities	Effectively communicate research priorities and conservation actions with partners	CTT and Mgt Board sub-group	Begin revisions in Oct/Nov each year. Present to Mgt Board prior to spring teleconference for finalization	Implementation Plan 2016-2018 completed
Administer a RFP to solicit proposals addressing high priority science needs	Ensure that the research program culminates in strong foundation for conservation actions	CTT and Mgt Board; administration of RFP by U.S. Coordinator	RFPs issued in July 2015 and July 2016	SDJV funded 7 science projects in FY2016, 6 projects in FY2017

WORK PLAN (2017-2019): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
Revise Implementation Plan to reflect current research priorities	Effectively communicate research priorities and conservation actions with partners	CTT and Mgt Board sub-group	Begin revisions in Oct-Dec each year. Present draft to Mgt Board prior to spring teleconference for finalization
Implement research program addressing new priorities and focal areas	Ensure that the research program culminates in strong foundation for conservation actions	CTT	Decisions made by December each year

WORK PLAN (2017-2019): Unique In-Year Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
2017			
Re-evaluate priorities and focal areas for research program	Ensure that the research program culminates in strong foundation for conservation actions	CTT subcommittees and Mgt Board	Incorporated into revision of Implementation Plan 2017-2019
<u>If funding levels justify</u>, post a competitive RFP addressing sea duck research priorities	Address priority knowledge gaps and capitalize on partnership opportunities	CTT and Mgt Board	RFP would be posted in July 2017 with funding decisions made during fall CTT and Mgt Board meetings

COMMUNICATION AND OUTREACH

A Strategic Communications Plan was completed in March 2015 (Dayer 2015; http://seaduckjv.org/science-resources/#planningdocuments). The plan is focused on helping the SDJV address four goals, or outcomes:

- Goal 1. The SDJV contributes to scientific information about sea ducks and their habitats that is readily available and used by stakeholders.
- Goal 2. SDJV partners collaborate on research and monitoring to address sea duck conservation and management needs.
- Goal 3. SDJV priority actions that advance sea duck conservation and management are implemented.
- Goal 4. The SDJV is widely recognized as the leading conservation program for sea ducks and has a strong and informed constituency for sea ducks.

ACCOMPLISHMENTS: 2015-2016

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES	OUTCOME
Work with agency outreach specialists to identify priority communication and education needs of SDJV	Create an outreach plan for the SDJV, rather than using an ad hoc approach	Mgt Board co-chairs have lead; USFWS outreach officer identified at HQ, also in Region 5	December 2012; Outreach plan is drafted, initial products prepared	Strategic Communications Plan completed March 2015
Improve communication and increase awareness of SDJV progress and accomplishments within the waterfowl community	Creates an easily accessible summary of annual work completed or supported, to help compare progress against priorities	Coordinators	Annual progress reports and annual newsletter highlighting key projects; post on web site	Progress report for Atlantic and Great Lakes Migration study completed and distributed to partners June 2015; 1st annual newsletter released spring 2016
Interact with National Science Support Team	Ensure that the needs of sea ducks are incorporated into NAWMP Science Team activities	CTT and Mgt Board members on NSST	Annually	Ongoing; provided input into population objectives and mapping of significant sea duck areas
Interact with LCC planning, climate change and other initiatives	Ensure sea duck needs are addressed	Chris Dwyer, USFWS Region 5 Mgt	Use this information to brief CWS Regional Directors	Interacted with LCCs on an individual basis.

		Board rep, Tim Bowman Sean Boyd, Christine Lepage, Scott Gilliland	who are sitting on the LCC Boards	Environment Canada has representation on LCC Boards and Technical Committees, interacting with LCCs on individual basis as opportunities arise
Facilitate an international sea duck conference every 3 years	Facilitate information exchange and priority-setting in the research community at large	SDJV members of conference organizing committees, past and present	Conference scheduled for February 2017, San Francisco	Conference planned for San Francisco February 2017
Maintenance and improvements to SDJV web site	Web site serves as clearinghouse for sea duck information, research updates, and news	Tim Bowman	Ongoing	On track; web site overhaul completed April 2015; continually making improvements
Revise Sea Duck Information Series to reflect current state of knowledge	General up-to-date information about all sea duck species. Distributed as hardcopy series and on web.	Tim Bowman and CTT	Ongoing	Most revisions made, a few more needed and underway
Provide an update on SDJV for Habitat Matters publication	Improve communication and foster partnerships	Canadian Coordinator	Ongoing	Completed; 2015 article about Aerial Survey Training Guide. 2016 article about Barrow's Goldeneye work in Pacific
Develop talking points for use by Management Board, CTT, and others	Communicate concisely SDJV purpose and key facts	Tim Bowman	Completed	Incorporated into web site banner photos in 2016. Develop wallet-sized cards September 2016

WORK PLAN (2017-2019): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
Work with agency outreach specialists to identify priority communication and education needs of SDJV	Outreach efforts targeted to specific issues or audiences	Mgt Board co-chairs have lead	Assignments and completion dates to be made based on project subject matter and

			scope
Improve communication and increase awareness of SDJV progress and accomplishments within the waterfowl community	Creates an easily accessible summary of annual work completed or supported, and results of studies	Coordinators	Annual report / newsletter and/or e-blast highlighting key findings; project reports posted on web site
If applicable, circulate the RFP to the largest audience possible	Ensure awareness of funding opportunities to capitalize on partnership opportunities and further leverage SDJV funds	All CTT members to circulate the RFP to their regional distribution list (academics, state or provincial partners, etc.)	When warranted, an RFP for the SDJV is posted on the web and circulated to diverse consitituencies.
Facilitate communication and information sharing among sea duck managers and researchers internationally	Share scientific information, help facilitate research partnerships, policy development	Coordinators, conference planning committee	Planning for International Sea Duck Conference every 3 years – next one in 2020; distribute annual report; reports by flyway reps to flyway councils
Maintain and Improve SDJV web site	Web site serves as clearinghouse for sea duck information, research updates, and news	Tim Bowman	Ongoing updates as needed
Provide an update on SDJV for Habitat Matters publication	Improve communication and foster partnerships	Canadian Coordinator	Ongoing
Provide progress reports and results of SDJV research and monitoring programs to BOEM, NOAA and other relevant agencies	Ensure that consideration is given to sea duck habitat use and requirements in the development and assessment of offshore wind farms and Coastal and Marine Spatial Planning activities	Tim Bowman, CTT and Mgt Board Members as applicable	Report for Atlantic and Great Lakes Migration Study is circulated to all partners, posted on web site, and included in remote sensing reports by Dept of Interior

WORK PLAN (2017-2019): Unique In-Year Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
2017			
6th International Sea Duck Conference, San Francisco, CA	Share scientific information, help facilitate research partnerships, policy development	Members of conference planning committee; presenters	6th International sea duck conference held February 2017
2018			
2019			
Planning for 7th International	Share scientific information,	Members of	To be held in 2020;

Sea Duck Conference, Halifax, NS	help facilitate research partnerships, policy development	conference planning committee; presenters	dates not yet determined

ADMINISTRATION AND COORDINATION

The administration of the SDJV is the responsibility of the Management Board and is achieved through direction from the Management Board to the two National Coordinators and the co-chairs of the CTT as well as assignments to sub-committees of the Board and CTT. It is incumbent upon the Management Board, Coordinators, CTT co-chairs and relevant committees to develop and undertake an annual, on-going process to ensure that the Joint Venture focuses on the highest priority research and monitoring needs that can inform conservation management decisions. Progress toward achieving measureable objectives and focusing the SDJV research and monitoring programs should be discussed on a frequent basis to ensure that the SDJV continues to move strategically toward meeting the needs of managers, decision-makers and Habitat Joint Ventures.

ACCOMPLISHMENTS: 2015-2016

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES	OUTCOME
Review Strategic priorities to be focused on by JV. Refine their integration into Implementation Plans	Ensure that research and monitoring programs are addressing most pressing conservation and management needs	Mgt Board and CTT co-chairs and sub-committees, and Coordinators.	Review at November CTT meeting; present draft at March Mgt Board meeting.	Discussed at joint CTT/MB meeting Nov2015 and 2016. Priorities integrated into this plan
Post RFPs in appropriate ornithological and public outlets	Ensure awareness of funding opportunities and priorities	Tim Bowman	In years when research funds are available for allocation, the RFP is posted in July	General RFP completed as planned for FY2016 and FY2017
Process and distribute proposals for CTT review and scoring	Ensure adequate review time and consistency	Tim Bowman	October, annually	Completed
Solicit and post on web all annual reports from SDJV-sponsored research and monitoring projects	Information is effectively communicated with SDJV and waterfowl managers received to permit	Tim Bowman	October annually	Completed

	evaluation of SDJV approach			
Prepare summary of funding and other recommendations for Mgt Board review	Ensure effective communication among JV entities	Tim Bowman	Annually, prior to Mgt Board fall meeting	Completed
Notify successful applicants for research and monitoring projects	Administrative	Tim Bowman	By 10 January annually	Completed
Process contracts, purchase orders, and coop agreements in support of SDJV funded projects	Administrative	Tim Bowman	January-April annually	Completed
Facilitate and coordinate purchase of satellite transmitters for SDJV projects as required	Capitalize on efficiencies related to bulk discounts	Tim Bowman	January-April annually	Completed
Prepare summary notes and briefing documents for CTT and Mgt Board meetings	Ensure adequate communication among JV staff	SDJV Coordinators	As needed	Completed
Secure adequate meeting space, logistics, and arrange teleconferencing in support of CTT and Mgt Board meetings	Ensure effective communication and efficiency	Tim Bowman; hosting staff	As needed	Completed
Annual Financial Report to USFWS Division of Bird Habitat Conservation	Document use and leveraging of all SDJV funds	Tim Bowman	December annually	Completed
Annual financial summary to NTS Canada	Document use and leveraging of SDJV funds in Canada only	Canadian coordinator	December annually	Completed for 2015

WORK PLAN (2017-2019): Core Annual Tasks

TASK/DELIVERABLE	NEED BEING SERVED	LEAD	BENCHMARKS / COMPLETION DATES
Review Strategic priorities to be focused on by JV. Refine and integrate into Implementation Plans	Ensure that research, monitoring, and outreach programs are addressing most pressing conservation and management needs	Mgt Board and CTT co-chairs and sub-committees, and Coordinators	Review at fall CTT meeting; present draft to Mgt Board for spring teleconference
Post RFPs in appropriate ornithological and public outlets	Ensure awareness of funding opportunities and priorities	Tim Bowman	In years when warranted, post RFP in July
Process and distribute proposals for CTT review and scoring	Ensure adequate review time and consistency	Tim Bowman	October, annually
Solicit and post on web	Information is effectively	Tim Bowman	October annually

all annual reports from SDJV-sponsored research and monitoring projects	communicated with SDJV and waterfowl managers received to permit evaluation of SDJV approach		
Prepare summary of funding and other recommendations for Mgt Board review	Ensure effective communication among JV entities	Tim Bowman	Compiled after fall CTT meeting annually, presented to Mgt Board at their next meeting
Notify successful applicants for research and monitoring projects	Administrative	Tim Bowman	By 10 January annually
Process contracts, purchase orders, grants, and coop agreements in support of SDJV funded projects	Administrative	Tim Bowman	January-July annually
Provide debriefings to unsuccessful applicants	Constructive feedback to researchers; done only on request by applicant	Tim Bowman & USFWS contracting	In January, if required
Facilitate purchase of satellite transmitters for SDJV projects as required	Capitalize on efficiencies related to bulk discounts	Tim Bowman	January-April annually
Prepare summary notes and briefing documents for CTT and Mgt Board meetings	Ensure adequate communication among JV staff	SDJV Coordinators	As needed
Secure adequate meeting space, logistics, and arrange teleconferencing in support of CTT and Mgt Board meetings	Ensure effective communication and efficiency	Tim Bowman; hosting staff	As needed
Annual Financial Report to USFWS Division of Bird Habitat Conservation	Document use and leveraging of all SDJV funds	Tim Bowman	December annually
Annual financial summary to NTS Canada	Document use and leveraging of SDJV funds in Canada only	Canadian coordinator	December annually

Table 1. High priority science needs.

Science Need	***Status***
1. Develop or refine techniques to estimate detection probabilities, misidentification rates, and count biases during aerial sea duck surveys	Partially addressed through projects funded in FY2017
2. Support for the Waterfowl Breeding Population and Habitat Survey review including analyzing data with respect to reallocation of survey effort	SDJV funds provided to USFWS in FY2016; scoter breeding survey funded in FY2017-2018 also connects with this need
3. Develop efficient methods for automating counts of birds in aerial photographs of large flocks, including birds with varying distribution and density patterns, and uniform vs dimorphic plumage	SDJV is partially funding a USFWS project on automated detection and machine learning in FY2017
4. Determine population monitoring and information needs for management and conservation of sea ducks on the Great Lakes	Project funded in FY2017 through Univ Wisconsin
5. Evaluate and modify veterinary and/or husbandry techniques to improve survival of sea ducks, particularly Surf Scoter, White-winged Scoter, and Long-tailed Duck, marked with implantable transmitters	Currently no active SDJV-funded projects addressing this science need
6. Demonstrate the spatial resolution of stable isotope analysis of sea duck feather samples to determine breeding and molting areas in the absence of reference samples, particularly for scoters and Long-tailed Duck	Currently no active SDJV-funded projects addressing this science need
7. Determine if recruitment is a problem for the American Common Eider (ACOEI) and if so, identify the limitations. This broad topic includes elements that could affect fecundity (e.g. breeding propensity, clutch size, nest success, hatching success), duckling survival (direct: duckling predation; indirect: habitat, disease, etc.), etc.	Project funded by SDJV in FY2016 is partially addressing this science need, but more research will likely be needed
8. Determine whether sufficient population structure exists across the range of priority sea duck species to assess whether their populations should be managed as stocks or sub-populations, and ensure that research directed at reducing uncertainty in key demographic rates for population modeling efforts are applied at the appropriate geographic scales	SDJV currently working on summarizing available information for all species derived from telemetry, banding, genetics, and isotope studies
9. Conduct satellite telemetry projects for Surf and White-winged Scoter on the Pacific coast to determine the following: a) linkages among breeding, molting, staging and wintering areas, b) key migration corridors and timing	Part of ongoing multi-year project in Alaska, FY2017 and FY2018

of migration, c) important habitats/sites used during the above stages, d) level of inter-annual return rates to breeding, molting and wintering habitats, and e) determine the magnitude of overlap in breeding distribution between Atlantic and Pacific wintering populations	
10. Conduct satellite telemetry projects for White-winged Scoter and Long-tailed Duck on the Atlantic coast and Great Lakes to determine the following: a) linkages among breeding, molting, staging and wintering areas, b) key migration corridors and timing of migration, c) important habitats/sites used during the above stages, d) level of inter-annual return rates to breeding, molting and wintering habitats, and e) determine the magnitude of overlap in breeding distribution between Atlantic and Pacific wintering populations	Part of ongoing multi-year projects in New England and Lake Michigan, FY2017
11. Based on experimental winter sea duck surveys conducted in 2008-11, design mid-coast Atlantic survey to assess distribution and abundance of Surf scoters and Long-tailed Duck and solicit feedback from the management and conservation communities.	Will be considered through ongoing review of sea duck monitoring surveys and needs
12. Analyze existing tissue samples for key contaminant levels in sea ducks to document species- and geographic variation and identify potential contaminant problems, or lack thereof	Currently no active SDJV-funded projects addressing this science need. Blood samples are archived at BRI
13. Develop a proof-of-concept model/procedure for estimating sea duck carrying capacity on wintering areas	Currently no active SDJV-funded projects addressing this science need
15. Test feasibility of determining age and sex ratios (over a broad range) using ground surveys and/or aerial photos on fall/wintering areas to obtain an index of annual productivity for some species (e.g., Surf Scoter, Black Scoter)	Currently no active SDJV-funded projects addressing this science need
16. Assess and improve both subsistence harvest estimates and fall sport harvest surveys, including enhanced parts collection surveys to provide more precise estimates of harvest and to determine age and sex ratios	Currently no active SDJV-funded projects addressing this science need, but is subject of discussion by Atlantic Flyway
18. Determine important factors (weather, predators, food, etc.) affecting survival and reproductive success (fitness) of scoters and Long-tailed Ducks throughout species ranges	Currently no active SDJV-funded projects addressing this science need
19. Determine annual survival rates for scoters (Surf, White-winged, or Black) wintering on the Pacific and Atlantic coasts, with emphasis on adult birds	Currently no active SDJV-funded projects addressing this science need
20. Evaluate monitoring programs for American Common	Project funded by SDJV

Eider targeted at key periods during the annual cycle (breeding, molting, wintering) to determine which approach will provide information on trend and abundance necessary for management of the subspecies in the most cost effective manner	in FY2016 is partially addressing this science need, but more research will likely be needed
21. Improve estimates of harvest for American Common Eider by improving the sample for eider hunters in current national harvest surveys (including consideration of a hunter outreach program to increase hunter participation in the survey)	Currently no active SDJV-funded projects addressing this science need, but is subject of discussion by Atlantic Flyway.
22. Improve estimates of harvest for American Common Eider using genetics techniques to discriminate among geographic areas in the Species Composition Survey (parts collection)	Addressed through project funded by SDJV, FY2017-2019
23. Identify and characterize attributes of key seasonal use areas for Long-tailed Duck (e.g., winter, staging) at flyway or continental scale	Currently no active SDJV-funded projects addressing this science need
24. Characterize molting habitats for Atlantic Black Scoter, identify the factors responsible for their selection, and predict how climate change may impact molting habitats and distribution of molting birds	Currently no active SDJV-funded projects addressing this science need