

**RESPONSIVENESS SUMMARY
FOR THE STUDY PLAN FOR
YEAR 2004 AVIAN INVESTIGATIONS
HUDSON RIVER**

**HUDSON RIVER NATURAL RESOURCE
DAMAGE ASSESSMENT**

HUDSON RIVER NATURAL RESOURCE TRUSTEES

STATE OF NEW YORK

U.S. DEPARTMENT OF COMMERCE

U.S. DEPARTMENT OF THE INTERIOR

FINAL

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PREPARED FOR HUDSON RIVER NATURAL RESOURCE TRUSTEES

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EXECUTIVE SUMMARY

This Responsiveness Summary for the Study Plan for Year 2004 Avian Investigations for the Hudson River was prepared by the Hudson River Natural Resource Trustees (Trustees) -- New York State, the U.S. Department of Commerce, and the U.S. Department of the Interior. The Trustees are working cooperatively to conduct a Natural Resource Damage Assessment (NRDA) for the Hudson River. This Responsiveness Summary provides Trustee agency responses to public comments on and questions about the Study Plan for Year 2004 Avian Investigations for the Hudson River, Draft for Public Review and Comment, dated March 11, 2004, released by the Trustees for public review and comment.

INTRODUCTION

Pursuant to the Hudson River Natural Resource Damage Assessment (NRDA) Plan (Hudson River Natural Resource Trustees 2002), the Trustees developed a Study Plan for Year 2004 Avian Investigations for the Hudson River, Draft for Public Review and Comment (Draft Avian Injury Study Plan) (Hudson River Natural Resource Trustees 2004a), and engaged in public review of that Draft Avian Injury Study Plan.

On March 15, 2004, the Draft Avian Injury Study Plan was released by the Trustees to the public. In that Draft Avian Injury Study Plan, the Trustees asked the public and the party(ies) responsible for the contamination to review the Draft Avian Injury Study Plan and provide feedback on the proposed approach. The Draft Avian Injury Study Plan noted that the Trustees sought public input to help them in planning and conducting an assessment that is scientifically valid, cost effective, and that incorporates a broad array of perspectives.

A Notice of Availability of the Draft Avian Injury Study Plan was announced in the Federal Register on March 30, 2004. Availability of the Draft Avian Injury Study Plan was also announced by the Trustees on the Hudson River NRDA web sites maintained by the New York State Department of Environmental Conservation, the U.S. Fish and Wildlife Service (FWS), and the National Oceanic and Atmospheric Administration (NOAA), and through a listserv maintained by the Trustees. A 45-day comment period was provided to the public. The public comment period closed on April 29, 2004.

All comments received on the Draft Avian Injury Study Plan, as part of the peer and public review process, were considered. The Trustees appreciate the input in these comments and the effort by commentors to provide this level of review. The Trustees evaluated peer and public comments and, where warranted, incorporated these comments in the Draft Avian Injury Study Plan to produce the Study Plan for Year 2004 Avian Investigations for the Hudson River, Final, Public Release Version, dated June 15, 2004 (Final Avian Injury Study Plan) (Hudson River Natural Resource Trustees 2004b). In the remaining instances, public comments on the Draft Avian Injury Study Plan were addressed by letter to the commentor, acknowledging receipt of comments and providing an initial response and noting that a more detailed Responsiveness Summary (this document) would be provided by the Trustees in the near future.

PUBLIC COMMENTS RECEIVED

Two letters from the public were received in response to the Draft Avian Injury Study Plan: a letter from The General Electric Company (GE), the Potentially Responsible Party, dated April 28, 2004; and, a letter from Scenic Hudson, dated April 27, 2004.

Below, the text of those two comment letters is provided, along with the Trustee response (in italicized text) to comments. Accordingly, this Responsiveness Summary documents: comments that were received; that those comments were considered by the Trustees; and how the Trustees addressed those comments. (Please note that, in general, typographical errors in the comment letters have not been corrected in this document.)

Letter from General Electric, dated April 28, 2004

GENERAL COMMENTS

A. Similar to the trustees September 2002 NRDA Plan, the Avian Study Plan provides the reader with only a general understanding of the proposed study and fails to provide the level of detail necessary for meaningful technical comment on the proposed approach. This lack of detail is inconsistent with good scientific practice and violates applicable agency Information Quality Guidelines for the basic standard of quality for scientific data disseminated by the federal government. For example, there are no details provided for monitoring kingfisher, sandpiper and tree swallow reproductive success, analytical methods, or statistical methods to be used for data analysis. This type of detail is required to determine the scientific integrity of the study and is necessary to provide detailed technical comment on the proposed approach. When will this level of detail be provided for review and comment? Will it be provided prior to initiation of the study? How will the trustees ensure compliance with the agency guidelines?

Regarding level of detail, the Trustees' Final Avian Injury Study Plan (Hudson River Natural Resource Trustees 2004b) includes additional details and clarification beyond that provided in the Draft Avian Injury Study Plan. The Final Avian Injury Study Plan includes a Study Plan prepared and approved by the U.S. Geological Survey (USGS Study Plan) for the investigation of belted kingfisher, spotted sandpiper and tree swallow. The USGS Study Plan notes that the avian study to be conducted by the USGS has the following objectives: to determine if reproductive success of spotted sandpipers, belted kingfishers, and tree swallows nesting on the Hudson River is negatively affected by PCB exposure; and, to determine organic contaminant accumulation rates in belted kingfisher chicks on the Hudson River. Additionally, the USGS' Technical Operating Procedure (TOP) for this work has been incorporated into the Final Avian Injury Study Plan (in Appendix A). That TOP provides details not contained in the Trustees' Draft Avian Injury Study Plan, including details regarding the collection and processing of sandpiper, kingfisher and swallow eggs, and details regarding collection and processing of kingfisher chicks.

Pursuant to the Department of the Interior (DOI) Natural Resource Damage Assessment (NRDA) regulations at Title 43 of the Code of Federal Regulations (CFR) Section 11.64(a)(2), in developing these objectives, the Trustees have considered the availability of information from response actions relating to the hazardous substance release, the resource exposed, the characteristics of the hazardous substance, the potential physical, chemical, or biological reactions initiated by the hazardous substance release, the potential injury, the pathway of exposure, and the potential for injury resulting from that pathway.

A section regarding hypotheses and statistical tests (section 4.1.1.) has been added to the Trustees' Final Avian Injury Study Plan. This section describes the comparisons the Principal Investigator (PI) plans to conduct, providing null and alternative hypotheses, and statistical tests. These hypotheses and statistical tests may be revised, or not performed, by the PI based on data collection. Further, the PI may test hypotheses and conduct additional statistical tests not noted in the Final Avian Injury Study Plan.

The USGS Study Plan notes that data analysis will be performed using SAS® or other commercially available statistical software. Collected data will be summarized using measures of central tendency (e.g., means, medians) and variability (e.g., parametric or nonparametric confidence intervals).

The level of specificity in the Final Avian Injury Study Plan is consistent with the DOI regulations at 43 CFR Section 11.31. The Final Avian Injury Study Plan includes information regarding sampling locations, study design, numbers and types of samples to be collected, and analyses to be performed.

As a result of the peer and public review process the Draft Avian Injury Study Plan has been modified to include additional details and clarification in the Final Avian Injury Study Plan, including but not limited to those noted above. However, none of the public comments received on the Draft Avian Injury Study Plan warrants revision of the Study Plan to the extent that a new public notice period is needed.

Regarding the Information Quality Act (IQA), as noted in the Trustees' Responsiveness Summary for the NRDA Plan, the FWS and NOAA will ensure compliance with the agency guidelines for information that will be disseminated to the public by applying new and existing standards in the guidelines and performing a pre-dissemination review of information. It has been certified that the Trustees' Final Avian Injury Study Plan meets the standards for information quality. Additionally, collected data resulting from activities described in the Study Plan that are disseminated to the public will have met the applicable IQA standards, depending on the manner in which they are disseminated (e.g., as raw data or interpreted results).

B. GE previously commented that the Quality Assurance Management Plan (QAP) appended to the September 2002 NRDA Plan is not in fact a quality assurance plan as required in the Department of Interior (DOI) regulations [43 C.F.R. § 11.31(c)(2)], but rather a recitation of guidance for preparing study specific quality assurance plans. In the trustees' July 2003 Responsiveness Summary for the Hudson River NRDA Plan, the trustees indicated “[f]or each data collection effort that is part of the Hudson River NRDA and is identified in the Plan, the Trustees will develop a project specific Quality Assurance Plan which may be an independent document or may be incorporated into the project Study Plan” (Responsiveness Summary for the Hudson River NRDA Plan at page 8). However, in the Avian Study Plan, it is indicated that “this study is being conducted in accordance with the Quality Assurance Management Plan for the Trustees’ Hudson River NRDA...” and that the trustees’ analytical quality assurance plan will be updated to include measurement quality objectives (Avian Study Plan at page 7). The lack of a QAP for the Avian Study Plan is inconsistent with the trustees’ commitment to develop such plans and is counter to good scientific practice. It also is contrary to Department of Interior regulations, which call for the inclusion of a quality assurance plan that “satisfies the requirements listed in the NCP and applicable EPA guidance.” 43 C.F.R. § 11.31(c)(2). Has a quality assurance plan been developed for the Avian Study Plan? If not, will a quality assurance plan be developed? If one has been or will be developed or if the existing NRDA Plan QAP has been updated, when will it be provided for review and comment?

A Quality Assurance (QA) Plan has been developed for the avian study and incorporated into the USGS Study Plan (Section F, Quality Control/Quality Assurance Plan (QA Plan)). The Trustees’ Final Avian Injury Study Plan (Section 5, Quality Assurance Plan) provides additional details in this regard.

The QA Plan has been prepared pursuant to the DOI NRDA regulations which specify, at 43 CFR § 11.31(c)(2), that, “If the authorized official plans to use type B procedures, the Assessment Plan must include a Quality Assurance Plan that satisfies the requirements listed in the NCP and applicable EPA guidance for quality control and quality assurance plans.” As noted in the Trustees’ Responsiveness Summary for the NRDA Plan, for each data collection effort that is part of the Hudson River NRDA and is identified in the NRDA Plan, the Trustees will develop a project-specific Quality Assurance Plan which may be an independent document or may be incorporated into the project Study Plan. Such a QA Plan, in combination with the information on QA management described in the NRDA Plan, will ensure that the requirements listed in the National Contingency Plan and applicable EPA guidance for quality control and quality assurance plans are met.

Section F, Quality Control/Quality Assurance Plan, of the USGS Study Plan, in combination with the additional information noted in section 5 of the Trustees' Final Avian Injury Study Plan, constitutes the QA Plan for this effort. This QA Plan addresses the four general elements of QA identified by EPA guidance — project management, data generation and acquisition, assessment and oversight, and data validation and usability — and also includes information regarding study documentation, personnel experience and training, and chain of custody procedures.

The Trustees are in the process of updating the Trustees' Analytical Quality Assurance Plan for the Hudson River NRD. The Trustees will release that document when it is finalized. That has been clarified in the Trustees' Final Avian Injury Study Plan.

C. Neither the NRDA QAP nor the Avian Study Plan provide any detail concerning the proposed statistical approach to be used in the proposed approach or what constitutes a statistically significant difference in biological response between assessment area and control area population samples. When will this information be provided for review and comment?

See answer to General Comment A. above.

D. Other than indicating that proposed study plan activities are to begin in Spring 2004, a schedule for conducting activities associated with the proposed approach is not included in the Avian Study Plan. Based on life history characteristics of the species targeted for study, field work would likely need to commence in early- to mid-May to determine nest locations, monitor clutch size, and potentially to collect eggs for some species. Given that comments on the proposed approach are to be submitted on or before April 29 (as per the March 30, 2004 Federal Register notice), how will comments received be considered and implemented in the proposed approach prior to initiation of the study? For example, if any study design modifications, permit modifications and approvals, equipment purchases, or access agreements are necessitated by comments, is there adequate time to complete and incorporate these activities before proposed study activities would need to be initiated?

The Trustees' desire to keep the assessment moving along in a timely fashion and to provide an opportunity for public input into the process, while taking into consideration the life histories of the avian species of interest, necessitated a tight schedule for planning. The Trustees completed peer and public review activities and approved the Final Avian Injury Study Plan, including any necessary modifications to the work, before the 2004 avian egg collection by USGS began.

E. What is the rationale for further study of tree swallows along the Hudson River? There is insufficient detail in the Avian Study Plan to determine whether the currently proposed study would provide any information in addition to previous studies conducted by USFWS staff; however, it appears that the proposed study is redundant and therefore is unnecessary.

Tree swallows are known to be highly contaminated with PCBs from the Hudson River, and past studies of this species by the Trustees have indicated reproductive effects in this species. Additional work on tree swallows will potentially elucidate the connection between PCB levels in these birds and reproductive impairment. The goal of these additional investigations of Tree swallows is to better link the toxic equivalence of the contaminants in tree swallows to their reproductive success. The Final Avian Injury Study Plan includes additional details (see section E of the Avian Study Technical Operating Procedure) regarding the tree swallow component of the investigation.

SPECIFIC COMMENTS

A. Executive Summary

Page 1 - The Avian Study Plan states that this study plan will be peer reviewed. Again, GE commends the trustees for agreeing to peer review their work. The trustees' July 2003 NRDA Responsiveness Summary indicates that the trustees may modify study plans or reports to reflect the recommendations by peer review panels. When will the peer review of the Avian Study Work Plan take place? If modifications are required, when will they be completed? Will the public have the opportunity to review the modified study plan? Will the results and recommendations of the peer review be made available to the public?

The Study Plan was peer reviewed using an appropriate peer review mechanism by qualified specialists with necessary technical expertise. This level of peer review was sufficiently rigorous in light of the complexity of the study to ensure that the methods and study design were adequate to meet study objectives. Peer review of the work plan for the avian investigation took place in early 2004, overlapped with the public comment period, and has been completed. This has been noted in the Final Avian Injury Study Plan. Modifications have been made to the study; all such changes have been incorporated into the Trustees' Final Avian Injury Study Plan. The results and specific recommendations of the peer review will not be made available to the public because they are privileged pre-litigation materials. This has been noted in the Trustees' Final Avian Injury Study Plan and is consistent with statements made by the Trustees in their Responsiveness Summary for the NRDA Plan.

The public has been provided the Final Avian Injury Study Plan, which was published on the FWS web site on August 27, 2004, but will not be invited to provide comments on that document. The opportunity to provide comments on the Trustees' proposed approach was afforded to the public through release of the Draft Avian Injury Study Plan. None of the comments received on the Draft Avian Injury Study Plan warrants revision of the Study Plan to the extent that a new public notice period is warranted.

B. Section 1 - Background

Page 1 - In referring to previous tree swallow studies conducted along the Hudson River, the Avian Study Plan states in paragraph 3: "[r]eproductive effects observed included supernormal clutch size, reduced hatchability due to failure of embryos to develop (presumably infertile) and death of deformed embryos, high rates of nest abandonment, and other abnormal paternal behavior (McCarty and Secord 1999a, 1999b)."

This statement is not supported by the available data. Rather, the data indicate that there is no evidence of adverse reproductive effects to tree swallows along the Hudson River from PCB exposure (See "Technical Report: Evaluation of U.S. Fish and Wildlife Service Tree Swallow Studies Along the Hudson River" contained in GE comments on U.S. EPA's Hudson River PCB Feasibility Study and Proposed Remedial Action Plan, April 17, 2001). For example, reproductive parameters of Hudson River tree swallows (clutch size, number of eggs hatched per nest, chicks hatched per egg laid, number of birds fledged per egg laid and per nest) are comparable to those reported for other North American tree swallow populations. Moreover, among the Hudson River sites, the average number of chicks fledged per nest, hatch rate (number of birds hatched per egg laid) and reproductive success (number of birds successfully fledged per egg laid) increase with increasing PCB concentrations, which is the exact opposite relationship expected if PCB exposure negatively affects reproduction. Furthermore, the documents cited as support for the statement make no mention of deformities in Hudson River tree swallows or death of deformed Hudson River embryos.

Although there was not a statistically significant relationship between PCB concentrations in Hudson River tree swallows and reproductive parameters, there were high levels of nest abandonment and supranormal clutches that may be a response to PCB contamination (McCarty and Secord 1999a). Nest quality in these tree swallows' nests, largely a reflection of adult behavior, was correlated with PCB concentrations, with lower quality nests (typified by less mass and fewer feathers) constructed at sites with greater PCB contamination (McCarty and Secord 1999b). Additionally, abnormal plumage development was noted in females at the Hudson River sites (McCarty and Secord 2000).

C. Section 2 - Introduction

Page 2 - In the first paragraph of this section, the trustees describe the basis for their intent to conduct additional avian investigations as including, among other things, "input from a panel of avian experts". As noted in GE's comments on the NRDA Plan, the work of this panel should be transparent. Given that this panel's input was considered by the trustees in determining whether additional avian work should be conducted, and apparently the scope and methodology of such work, we request that you provide a list of the panel members, a copy of the materials provided to the panel members, and the panel's recommendations for public review.

A panel of experts was selected on the basis of necessary technical and scientific expertise required to consider, from a balanced perspective, the avian information available on the Hudson River and to define ideas or approaches for clarifying and documenting injury as defined in the U.S. Department of the Interior natural resource damage assessment regulations. The experts were provided with background information, key studies, and data to inform them of existing information on avian issues in the Hudson River system. The Trustees have concluded it is not appropriate to release the reviewers' identities, the specific material provided to the expert panel, nor the panel's recommendations at this time because the experts and peer reviewers may be witnesses in litigation, and the materials the Trustees provided these individuals are privileged under court rules. The Trustees responded, in the Responsiveness Summary for the NRDA Plan, to similar requests for information on the fish and mammal expert panels in this same fashion.

D. Section 4 - Methods

Page 4, Section 4.2.1, first bullet - Will tree swallows utilizing nest boxes recently placed along the Upper Hudson River by trustee representatives be included in this proposed study as well as those naturally occurring along the river?

The study will use tree swallow nest boxes. Specifically, 150 or more swallow boxes will be attached to posts, trees, or other suitable structures in suitable habitat at several sites along the Hudson River. Location of boxes and specific study sites will be determined during the first visit to the area, but may be modified in subsequent years of the study based on the professional judgment of the Principal Investigator. This use of boxes and their placement has been noted in the Final Avian Injury Study Plan. There is no intent to use tree swallows nesting in natural cavities.

Page 4, Section 4.2.1, third bullet - It is unclear how the suite of contaminants proposed for analysis was derived. For example, polybrominated diphenyl ethers were not an analyte in the trustees' 2002 avian egg study, yet they are to be analyzed in the current study. Also, the U.S. Geological Survey (USGS) reported that several metals appear to be elevated in avian samples previously collected by the USGS along the Hudson River during 1997-1999. (See "Determination of Elements in Samples of Blood and Various Tissue Matrices from the Hudson River, NY, USGS Final Report FY00-32-05, February 25, 2000"), yet these metals were not analytes in the trustees' 2002 avian egg study nor are they included as analytes in the current study. What is the rationale, justification and evaluation procedure for determining which compounds will be considered in this study? Is this procedure and results set out in documents and if so are these documents available?

The work contained in the Trustees' Final Avian Injury Study Plan is an avian injury investigation, and as such has a focus on determining whether injury exists, and if so, determining if the injury is caused by PCBs. This is in contrast to the Trustees' 2002 avian egg preliminary investigation, the purpose of which was to evaluate regional avian contamination with PCBs, not establish injury or determine causation. Determining injury and establishing causation requires additional work and a scope of analytical work not necessarily warranted in a preliminary investigation. We selected contaminants for analysis based on their presence in other Hudson River biota and consideration of the ecotoxicological literature.

Page 4, Section 4.2.1, third and fourth bullets - The Avian Study Plan states that tree swallow eggs will be analyzed only if determined warranted by the trustees. What criteria or conditions will warrant the analysis of tree swallow eggs?

Considerations that would warrant the analysis of tree swallow eggs (sample eggs or failed eggs) include observations such as substantial numbers of failed clutches or gross deformities. This is noted in the USGS Study Plan.

Page 5, Section 4.2.1 - The Avian Study Plan states that the trustees will assess the relationship between contaminant concentrations in nest sample eggs and parameters of nest reproduction by application of appropriate statistical analysis of data and determine whether the reproductive success of spotted sandpipers, tree swallows, and belted kingfishers nesting on the Hudson River have been impacted. What method of statistical analysis will the trustees use?

Data analysis will be performed using SAS® or other commercially available statistical software. Collected data will be summarized using measures of central tendency (e.g., means, medians) and variability (e.g., parametric or nonparametric confidence intervals). This is noted in the USGS Study Plan. Further, as noted above in the response to General Comment A, a section regarding hypotheses and statistical tests (section 4.1.1.) has been added to the Trustees' Final Avian Injury Study Plan. This section describes the comparisons the Principal Investigator plans to conduct, providing null and alternative hypotheses, and statistical tests. These hypotheses and statistical tests may be revised, or not performed, by the Principal Investigator based on data collection. Further, the Principal Investigator may test hypotheses and conduct additional statistical tests not noted in the Final Avian Injury Study Plan.

Page 5, Section 4.2.1 - The Avian Study Plan suggests that clutch size and hatching success will be used for the spotted sandpiper and clutch size, hatching success and fledging success will be used for the kingfisher as reproductive success endpoints, but is silent on which endpoints are to be used for tree swallows. What parameters of reproductive success will be used for tree swallows?

For tree swallows, clutch size, hatching success, and fledging success will be determined. This is noted in the USGS Study Plan.

Page 6, Section 4.2.3 - Monooxygenase activity is an indicator of exposure to any dioxin-like compound and is not itself an adverse effect nor is it predictive of adverse effects. How do the trustees intend to use this endpoint in the injury determination and quantification of the NRDA process?

The component of the investigation that entailed determination of monooxygenase activity in belted kingfisher chicks on the Hudson River has been deleted from the proposed work, and is not included in the Trustees' Final Avian Injury Study Plan.

Page 6, Section 4.3 - The objective and rationale for the belted kingfisher and spotted sandpiper egg injection pilot study is not stated and the relevance of this activity to the injury determination is unclear. From the limited information provided, the pilot study appears to be experimental at best for these species. Before comments can be provided on the pilot study, greater detail concerning the study design and protocol for the avian egg injection pilot study is required. What specific protocols will be used to conduct the pilot study and when will they be available for review and comment? Also, what criteria will be used to determine whether further study will be pursued?

Avian egg injection is a well-established technique to assess the effects of contaminants on a developing avian embryo. Conducting such work with eggs of belted kingfisher and spotted sandpiper, for example, would elucidate the effect of PCBs on developing embryos of these species. Results of injecting contaminants, such as PCBs, into avian eggs include embryomortality and malformation. Death, such as embryomortality, and physical deformation, such as external malformation, skeletal deformities, and organ and soft tissue malformation are injuries pursuant to the DOI NRDA regulations, and would be directly relevant to determining injury and establishing causation. This is noted in the Trustees' Final Avian Injury Study Plan.

The avian egg injection pilot study - as described in the Draft and Final Avian Injury Study Plans - was to be a preliminary investigation focused on incubation of eggs of Hudson River avian species in 2004 and did not entail injection of PCBs into eggs of those avian species of interest (kingfishers, sandpipers, etc.) in 2004. As a preliminary investigation, the Trustees did not plan to release a Study Plan describing this work for public review and comment, in accordance with the Hudson River NRDA Plan. The Hudson River NRDA Plan specifies different requirements for peer and public review of work plans for injury determination studies (such as the work being done by USGS pursuant to the Trustees' Final Avian Injury Study Plan) and preliminary investigations.

However, the Trustees have now determined that the work originally planned per the Trustees' Final Study Plan, to be initiated in 2004, and potentially continued into 2005, is unlikely to take place on that time schedule. Should future avian egg injection work by the Trustees entail a full-scale assessment of injury endpoints in Hudson River avian species of interest, we will prepare a Study Plan, which will undergo peer and public review in accordance with the Hudson River NRDA Plan (Hudson River Natural Resource Trustees 2002).

E. Section 6 - Quality Assurance/Quality Control

Page 7 - The Avian Study Plan states that all samples will be analyzed by appropriate methods approved by the trustees and that the contract laboratories will follow the trustees' updated Analytical Quality Assurance Plan. Please provide the specific analytical methods to be used and the updated Analytical Quality Assurance Plan prior to initiation of the proposed study for review and comment.

As noted in the response to General Comment B., the Trustees are in the process of updating the Trustees' Analytical Quality Assurance Plan for the Hudson River NRDA. The Trustees will release that document when it is finalized. That has been noted in the Trustees' Final Avian Injury Study Plan. The Trustees are using Performance Based Methodologies that don't require the analytical laboratory to follow a particular method but specify Measurement Quality Objectives (MQOs) that the laboratory is to meet. Analytical methods that are currently under consideration with respect to the MQOs include U.S. Environmental Protection (EPA) method 1668A, EPA method 1613B, Modified EPA (non-promulgated) Method 680, and Draft EPA Method 1614.

Letter from Scenic Hudson, dated April 27, 2004

Thank you for the opportunity to provide comments on the Hudson River Natural Resource Trustees Draft Study Plan for Year 2004 Avian Investigation for the Hudson River. We appreciate the Trustees efforts to adequately identify, assess and quantify the injuries caused by PCBs in the Hudson River.

As reflected in the Hudson River NRDA Plan there certainly appears to be clear evidence of injury to birds in the Hudson Valley due to exposure to PCBs.

PCBs have been shown to cause a range of adverse impacts in birds, including disease, behavioral abnormalities, genetic mutations, physical deformities, changes in brain chemistry, reduced hatching rates, embryo mortality, and death (35, 36, 37, 38). The levels of PCBs found in birds in the Hudson River watershed are greater than PCB concentrations known to initiate these responses in birds. For example, levels of 8 to 25 ppm PCB in eggs are associated with decreased hatching success for terns, cormorants, doves, and eagles (27). (p. 45 NRDA Plan)

The Hudson River NRDA plan also indicates "PCB concentration of approximately 310 ppm in the brain has been associated with death in a number of bird species." (p. 20-NRDA)

NRDA Bird Studies

It is not clear how this particular study fits into the Injury Determination and Quantification studies outlined in the NRDA plan that are designed to confirm exposure or to determine injury. Those studies are identified in Exhibit 4-2 as - Waterfowl Consumption Advisory, FDA Evaluation, and five biological injury studies. The five biological studies are a Preliminary Avian Evaluation, Breeding Bird Survey, Bird egg study, Floodplain exposure and bald eagle monitoring. It appears that the screening level survey of PCB levels in avian eggs that preceded this draft study plan was the beginning of the 'Bird Egg Study.' This draft study plan appears to be a continuation of the Bird Egg Study, however this study also seems to encompass certain elements of the 'Evaluation of Avian Exposure from Feeding on Floodplain Organisms,' as discussed on page 47 of the NRDA Plan. It would be helpful to briefly define the scope of this proposed study and how it fits into the overall assessment.

The Hudson River NRDA Plan describes the activities that constituted the Trustees' proposed approach when that document was issued by the Trustees in September 2002. As noted on Exhibit 4-2 of the NRDA Plan, and discussed on pages 45-48 of the NRDA Plan, the Trustees had in progress, at the time the NRDA Plan was issued, five studies focused on biological injury to birds: Preliminary Avian Evaluation, Breeding Bird Survey, Bird Egg Study, Evaluation of Avian Exposure from Feeding on Floodplain Organisms, and Bald Eagle Monitoring. Regarding the Bird Egg Study, it is noted in the NRDA Plan that based on the results of the 2002 avian egg preliminary investigation, the Trustees would determine whether injury determination and quantification studies were warranted. That preliminary investigation has been completed, and the Trustees have determined that further investigation into avian injury is warranted. Accordingly, the work described in the Trustees' Final Avian Injury Study Plan is a progression of past avian work by the Trustees, particularly the Preliminary Avian Evaluation and the 2002 screening level survey of PCBs in avian eggs (Bird Egg Study). As noted in the NRDA Plan, the Trustees may undertake additional studies (beyond those noted in the NRDA Plan) to provide a better understanding of exposure and potential injury of Hudson River avian resources.

Extent of Study

Perhaps earlier preliminary investigations narrowed the scope of the April-June 2002 screening level survey of PCBs to eleven avian species, however the limited scope of the species surveyed is unclear.

Additional detail has been added to the Final Avian Injury Study Plan in the discussion of the 2002 avian egg exposure preliminary investigation, clarifying the rationale for the selection of the 6 primary species, and 5 opportunistic species. These six species were selected because together they provide a balanced approach in that these species use different types of habitats common to the Hudson River, they consume different types of foods and they generally represent different ecological guilds. Further, all six of these avian species are reported to be relatively common breeders in the Hudson River floodplain and use wetlands for some portion of their life cycles. Finally, many of the prey species consumed by these six avian species include those for which PCB accumulation has been documented in other areas, and for which PCB accumulation in prey items from the Hudson River is likely to exist. As noted above in response to the GE comment regarding Page 4, Section 4.2.1, third bullet, the work contained in the Final Avian Injury Study Plan is an avian injury investigation, and as such has a focus on determining whether injury exists, and, if so, establishing causation from PCBs. This is in contrast to the Trustees' 2002 avian egg preliminary investigation, the purpose of which was to evaluate regional avian contamination with PCBs, not establish injury or determine causation.

In addition there are others species that one would assume would be a part of this analysis such as specific waterfowl species, terns, cormorants, doves and certain threatened species such as the bald eagle. Again being that it is not clear how this study fits into the overall assessment perhaps other avian species will be examined more closely at other stages of the assessment.

In addition to tree swallows both mallards and eagles have increased concentrations of PCBs - (20-62 ppm in non-viable bald eagles eggs (p. 24-NRDA).

PCB concentrations in the breast muscle and fat of Hudson River mallards ranged from less than 0.01 to 1.1 ppm and from less than 0.1 to 26 ppm, respectively (53, 54, 55). Non-viable bald eagle eggs collected along the Lower Hudson River contained between 20 and 62 ppm PCBs and the plasma of nestling and adult bald eagles contained between 0.2 and 14.0 ppm PCBs (57). (p45-NRDA Plan.)

The trustees would be encouraged to expand the scope of the bird injury assessment and would be encouraged to make sure that there is a thorough and extensive investigation of the injury to species such as mallards and the bald eagle, as briefly outlined in the NRDA Plan.

In the Lower Fox River NRD assessment it has been found that bald eagles have suffered reduced productivity in the assessment area. PCBs are likely to have caused or contributed to the reduced productivity in assessment area bald eagles. (p. 7-19 - Injuries to Avian Resources, Lower Fox River/Green Bay Natural Resource Damage Assessment May 1999).

The injury to the bald eagle should also be assessed in terms of the value of the loss of the public's ability to enjoy sighting this magnificent creature along the Hudson River for a number of years. Bald eagle sightings along the river appear to be increasing. While perhaps seeing a bald eagle along the Hudson River is difficult to put into a dollar figure, certainly such sightings hold tremendous social, spiritual, cultural and ecological value, which should be considered as part of this assessment.

The Fox River injury assessment also found that due to PCBs, Forster's, common, and Caspian terns have either suffered, or are likely to have suffered, adverse effects in the assessment area. These include low reproductive success, behavioral abnormalities, and physical deformations. In addition, PCBs have likely caused or contributed to adverse effects in double-crested cormorants, including reduced hatching success and physical deformations. (p. 7-19 - Injuries to Avian Resources, Lower Fox River/Green Bay Natural Resource Damage Assessment May 1999)

The Hudson River Valley is an important migratory bird pathway. To what extent will injury to migratory birds be assessed?

The Final Avian Injury Study Plan notes that other avian species may be examined more closely at other stages of the NRDA and may be the subject of other Study Plans. Any such work may focus on other migratory bird species, including endangered, threatened, and special concern bird species, and the geographic scope of such studies may differ from that used for the work which is the subject of this Study Plan.

Endangered, Threatened, Special Concern Bird Species

Endangered, Threatened, Special Concern bird species are identified in the September 2002 Hudson River NRDA Plan. They are: Peregrine falcon, short-eared owl, least bittern, bald eagle, northern harrier, king rail, upland sandpiper, osprey, cooper's hawk, red-shouldered hawk, common nighthawk, vesper sparrow, grasshopper sparrow. How does assessment of PCB injury to these species fit into the overall injury assessment?

See response to comment above on Extent of Study.

Geographic Scope of Study

We are concerned that the extent of injury to birds along the entire 200 miles of this site is not being adequately assessed by the geographic scope of this study.

Birds in the mid and lower Hudson have elevated levels of PCBs. Will findings from birds studies in the upper Hudson be extrapolated to draw conclusions about bird injury along all 200 miles of this site? Will there be additional bird injury studies for the mid and lower Hudson region? More importantly will restoration address such injury for the entire site and look to restore birds on a larger ecological or watershed basis?

Regarding geographic scope in general, see the response to the comment above on Extent of Study. Restoration will be situated and scaled to: be appropriate to the injuries identified and quantified; the availability of restorable habitat; and the practicality and cost effectiveness of restoration, among other factors.

The National Audubon has identified the following areas along the Hudson River as Important Bird areas. Will Trustee assessment and restoration consider these important bird areas?

National Audubon Important Bird Area Program

- Stockport Flats
- Tivoli Marshes
- Hudson Highlands State Park
- Constitution Marsh Sanctuary
- Doodletown and Iona Island
- Fahnestock State Park
- Hook Mountain
- <http://ny.audubon.org/iba/index.html>

There are also a number of other important birding areas in the lower and mid-Hudson region that are not identified on this list including but not limited to Croton Point, Norrie Point and Ramshorn-Livingston Wildlife Sanctuary.

The Trustees will consider all appropriate areas for restoration.

Reference Area

The study indicates that nest surveys may "possibly" include in reference location (Connecticut River or other). What will determine if a reference location is used? What criteria are used to select a reference location? It would appear a reference river would be helpful to assess injury.

The USGS Study Plan clarifies that reference areas will be used for all three species, and may include a reference area on the Hudson River (the reach of the River upstream of Glens Falls), rivers draining into the Hudson River (such as the Hoosic River) and rivers not directly associated with the Hudson River (such as the Connecticut River).

Reference areas will be selected from areas that are outside the chemical influence of the Site (that is, not contaminated with PCBs) as a result of the discharges from the GE's Ft. Edward and Hudson Falls plants and that possess similar habitat features of the study area.

Injury Assessment at Other Sites

The extent to which Trustees must prove injury is perplexing. It appears that injury assessments at other sites have clearly documented injury to birds that would support documentation to bird injuries in the Hudson River Valley.

As I am sure you familiar, injuries studies along the Lower Fox River found a number of injuries to birds caused by PCBs.

Injuries to Avian Resources, Lower Fox River/Green Bay Natural Resource Damage Assessment (May 1999) concluded that PCBs cause a number of adverse effects in birds that meet the NRDA definitions of injury. PCB caused adverse changes in viability in birds can include death, disease, behavioral abnormalities, physiological malfunctions, and physical deformities. (p. 3-22)

PCBs in eggs cause toxicity at low parts-per-million concentrations of total PCBs. (p.3-23)

PCBs in eggs cause toxicity at low, or sub parts per billion, concentrations as TCDD eq in eggs (p.3-23).

The Trustees will determine whether injury exists in accordance with applicable regulations.

Peer Review

This draft study indicates that the work done pursuant to this study will be peer reviewed. Will the peer review be a public process? Will observers be invited to be a part of the peer review? Does the responsible party have any input or play any role in the peer review process?

Peer review is addressed in the Trustees' Responsiveness Summary for the NRDA Plan. In that document it is noted that, "The Trustees expect to select peer reviewers and to allow those reviewers to conduct the reviews without direct public participation, in part because the costs of carrying out a fully expansive public participation process would be prohibitive. The Trustees expect that the peer reviews will generally be conducted similarly to those done at scientific journals, and that reviewers will be independent external experts, qualified in the particular field and not involved in the study or the case. In appropriate circumstances, the Trustees may forgo peer review. The Trustees may modify study plans or reports to reflect the recommendations by peer review panels." Pursuant to the Hudson River NRDA Plan, the results of the work conducted according to the Final Avian Injury Study Plan will be peer reviewed upon completion of the study, and the results then released to the public. The NRDA Plan affirms the Trustees' commitment to keeping the public informed on any decision by the Trustees to allow GE or other potentially responsible parties to implement all or any part of the Assessment Plan, and to share with the public information on any agreements between the Trustees and GE or other potentially responsible parties regarding procedures and schedules for sharing data, splitting samples, and results of analyses. Peer review will be conducted in accordance with the Trustees' guidelines for use of peer review. The Trustees' Responsiveness Summary for the Hudson River NRDA Plan provides additional details regarding the peer review process envisioned by the Trustees for such reports.

REFERENCES

- Hudson River Natural Resource Trustees. 2002. Hudson River Natural Resource Damage Assessment Plan. September 2002. U.S. Department of Commerce, Silver Spring, MD.
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- Hudson River Natural Resource Trustees. 2004b. Study Plan For Year 2004 Avian Investigations for the Hudson River. Hudson River Natural Resource Damage Assessment. Final. Public Release Version. June 15, 2004. U.S. Department of Commerce, Silver Spring, MD.
- McCarty, J.P. and A.L. Secord. 1999a. Reproductive ecology of tree swallows (*Tachycineta bicolor*) with high levels of polychlorinated biphenyl contamination. *Environ. Toxicol. & Chem.* 18:1433-1439.
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