South River Science Team Human Exposure Pathways Evaluation

Activities Update
April 23, 2010

Human Exposure Evaluation

The key objectives:

- **better identify potential exposure,**
- **define potential risks and uncertainties,**
- **communicate information to the public.**

Human Exposure Evaluation

Exposure Team Members

DEQ: Don Kain, Calvin Jordan, Bill Hayden

EPA: Betty Ann Quinn

VDH: Doug Larsen, Jonathan Falk, Dwight Flammia, Karen Gruszynski

DGIF: Steve Reeser, Paul Bugas, Nelson Lafon

DACS: David Brown

DuPont: Mike Liberati, Ralph Stahl, Annette Guiseppi-Elie, Tim Ireland

Human Exposure Evaluation

Exposure scenarios to be evaluated

- √ Fish Consumption
- √ Recreational Use of River
- √ Potential Drinking Water exposures
- √ Contact with soils on the floodplain
- – Potential dietary exposures
  - – Domestic consumption, e.g., Garden crops, Beef, Poultry
  - – Hunting consumption, e.g., waterfowl, small game

Communicating to public on these issues

Human Exposure Evaluation

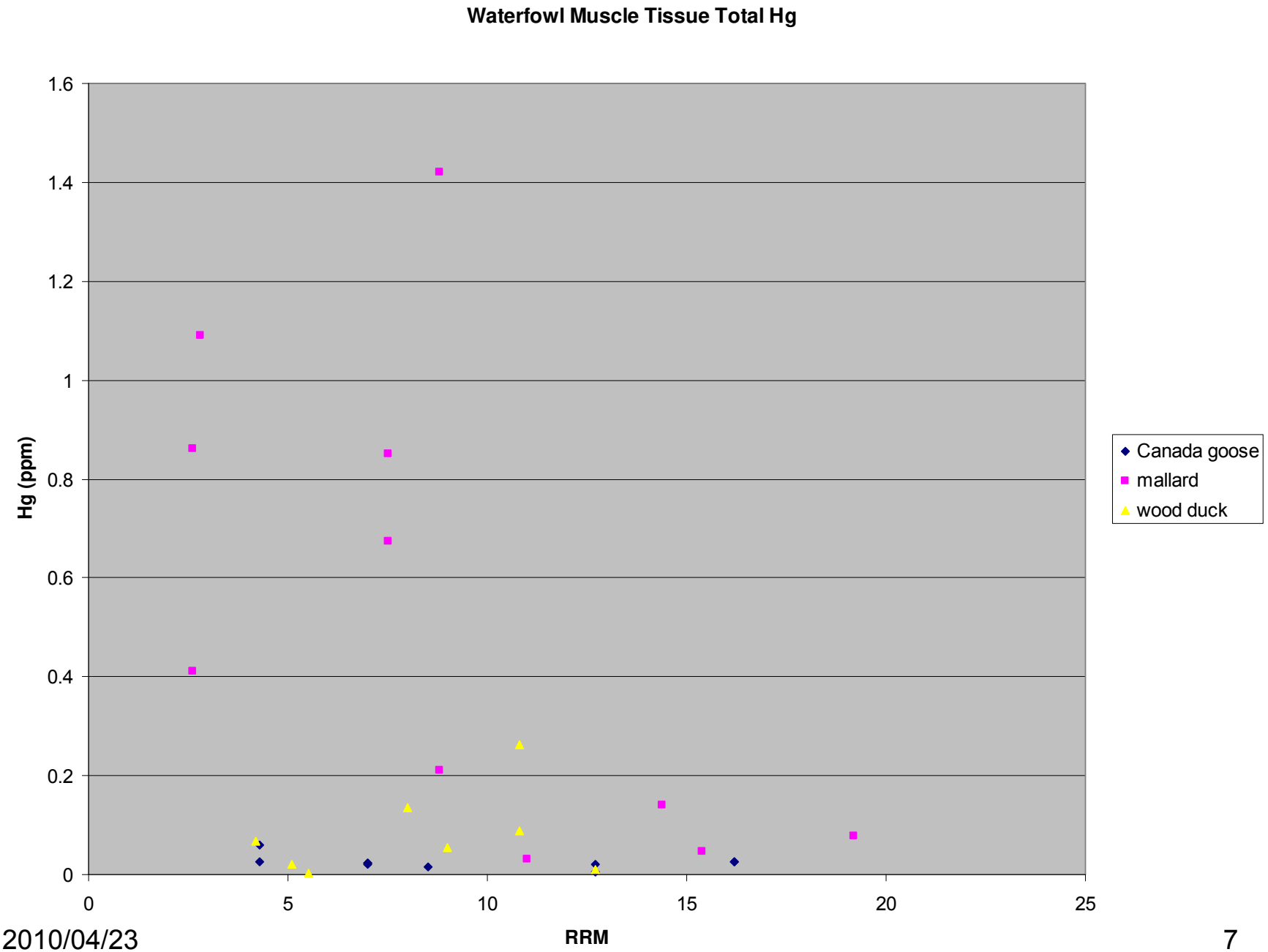
Floodplain soils

- Potential exposure evaluated:
  - √ direct contact (soil sampling);
  - √ ingestion of garden crops (2-year garden study);
  - √ ambient air (2 rounds of ambient air sampling)
  - – Next steps – communicating results
    - √ General conclusions included in fact sheet,
    - ✓ Letters to landowners sent, follow up phone calls
      - – Specific results on soil samples
      - – General conclusions
    - ✓ Fact sheet on soil sampling completed
    - • Peer review publication of garden crop study submitted

Human Exposure Evaluation

Potential dietary exposures

- Domestic consumption, e.g., Beef, Poultry
- Hunting consumption, e.g., waterfowl, small game
- √ Literature review of tissue levels completed
  - Includes domestic & game animals, total and methyl mercury
  - In general, results consistent with expectations
- √ Waterfowl samples results available
  - 10 Canada geese, 11 Mallards, 8 Wood ducks
  - In general, results consistent with expectations
- √ Results of small game analysis
  - Muskrats, squirrels available
- Next steps: develop plans to evaluate potential consumption


Waterfowl Muscle Tissue Total Hg
Hg (ppm)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
5
10
15
20
25
RRM
Canada goose
mallard
wood duck

Human Exposure Evaluation

Potential dietary exposures

- For wildlife evaluation, sampling plan for deer that graze on the floodplain based on likely exposure scenarios will be developed. Considerations for developing the plan include:
  - Rationale for choosing deer (versus, for example, raccoons, mourning doves, opossum, turkey, etc)
  - Supplemental sampling of Wood ducks.
  - Results of prior wildlife (waterfowl, squirrels, muskrats, snapping turtles)
- Sub-team (Jordan, Quinn, Bugas, Lafon & Guiseppi-Elie)
  - Workplan complete.
  - Research permit obtained.
  - Study in progress.

Human Exposure Evaluation

Potential dietary exposures

- For livestock evaluation, sampling plan for cattle that graze on the floodplain based on likely exposure scenarios will be developed. Considerations for developing the plan include:
  - How cattle are used and consumed
  - How milk from cattle is used/consumed
  - Defining which cattle actually graze on the floodplain
  - Use of the VDACS post-mortem facilities for determining general background levels as well as potential floodplain animals
  - Incorporating background levels in supermarket beef products
  - Rationale for choosing cattle (versus goats, sheep, pigs, poultry)
- A sub-team (Jordan, Quinn, Brown & Guiseppi-Elie) will draft plan for review by rest of team, implementation 2010

Human Exposure Evaluation

Health survey at local clinics

- √ Local physicians (explicitly made aware of issue) have not reported any signs/symptoms
- √ Local health clinics have been provided literature (in both Spanish and English)
- – Health survey to address effectiveness of consumption advisories
  - Survey completed
  - Data being analyzed

Human Exposure Evaluation

Communication

- Disseminate information to the public
- Opportunities:
  - √ Fish advisory signs/information kiosks
    - √ New signs in English & Spanish
  - √ Information to local health clinics
  - √ Information to local physicians (Newsletters)
  - √ Communications to landowners
  - – Fact Sheets (3 completed, 1 in review)
    - Garden Study Fact Sheet in progress
  - – Meetings with local officials
  - – Public presentations (rotary, schools)
  - – Community advisory panel (in progress)

Human Exposure Evaluation

Fact Sheets

- √ Fact sheets completed
  - √ Fact Sheet 1: General Introduction
    - *About the South River Science Team*


Fact Sheet 1

  - √ Fact Sheet 2: Exposure Summary
    - *People, Mercury, and the River*


Fact Sheet 2

  - √ Fact Sheet 3: Soil Sampling Results
    - *Summary of South River Floodplain Soil Survey*


Fact Sheet 3

- – Other Fact Sheets, as warranted
  - Potential 2010/2011
    - – Garden study (in progress)
    - – Wildlife