



Mercury Levels in Saltmarsh Sparrows on Region 5 Refuges

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Introduction

The Saltmarsh Sparrow (*Ammodramus caudacutus*) is an obligate saltmarsh passerine which breeds exclusively along the Atlantic coastline from Maine to Virginia. They are a watch list species and a “Bird of Conservation Concern” in Region 5. Since mercury levels in blood reflect current dietary exposure, sparrows are excellent indicators of mercury contamination in estuaries of the Northeast.

Study Area and Methods

As part of a larger study on saltmarsh sparrows in the Northeast, sparrows were captured on five National Wildlife refuges in southern Maine, northeastern Massachusetts, coastal Rhode Island, coastal Connecticut, and Long Island, New York from 2004-2010 (Figure 1). Birds were captured from June-August using mist nets, and 1-2 capillary tubes of blood were collected for mercury analysis (Figure 2).



Figure 2. Capture methodology and blood collection technique used for this study.

Geographic Distribution of Mercury

Mercury levels in the blood of adult sparrows were significantly higher in birds captured from Parker River NWR than from the other four refuges sampled for the period 2004 – 2010 (Figure 3). It is important to note that although mercury is high at Parker River NWR, levels within other areas of the range are also elevated and may be impacting overall species health. Our continuing research is attempting to identify potential point sources of mercury that might explain the elevated levels at Parker River NWR.

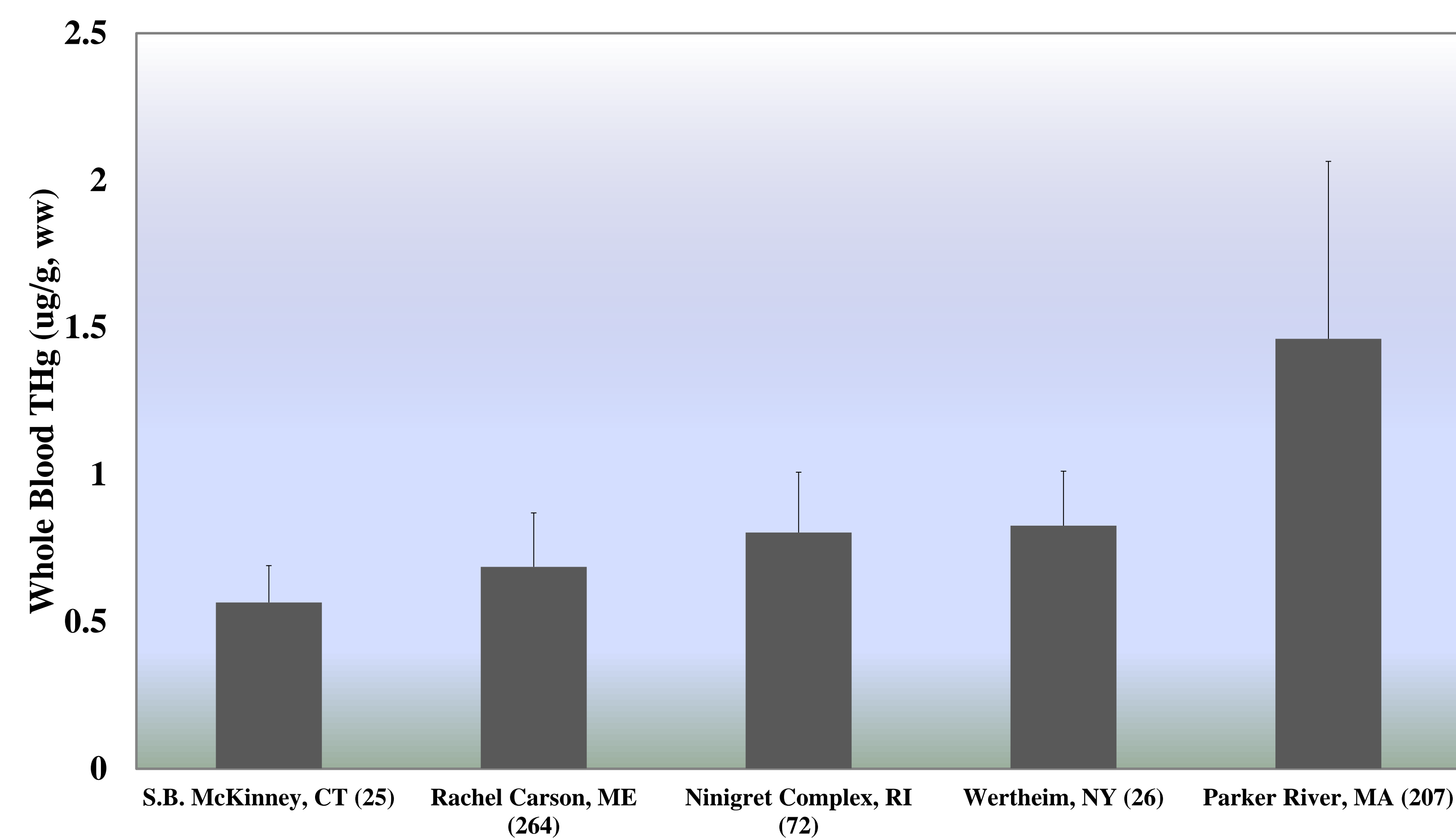


Figure 3. Mean total mercury levels in adult sparrows captured on national wildlife refuges in the Northeast, 2004-2010.

Annual Variation in Mercury Levels

Mean mercury levels in adult saltmarsh sparrow blood varied by year. Mercury levels exhibited a generally increasing trend at Parker River NWR while levels were relatively stable at selected units at Rachel Carson NWR for the period of 2004-2010.

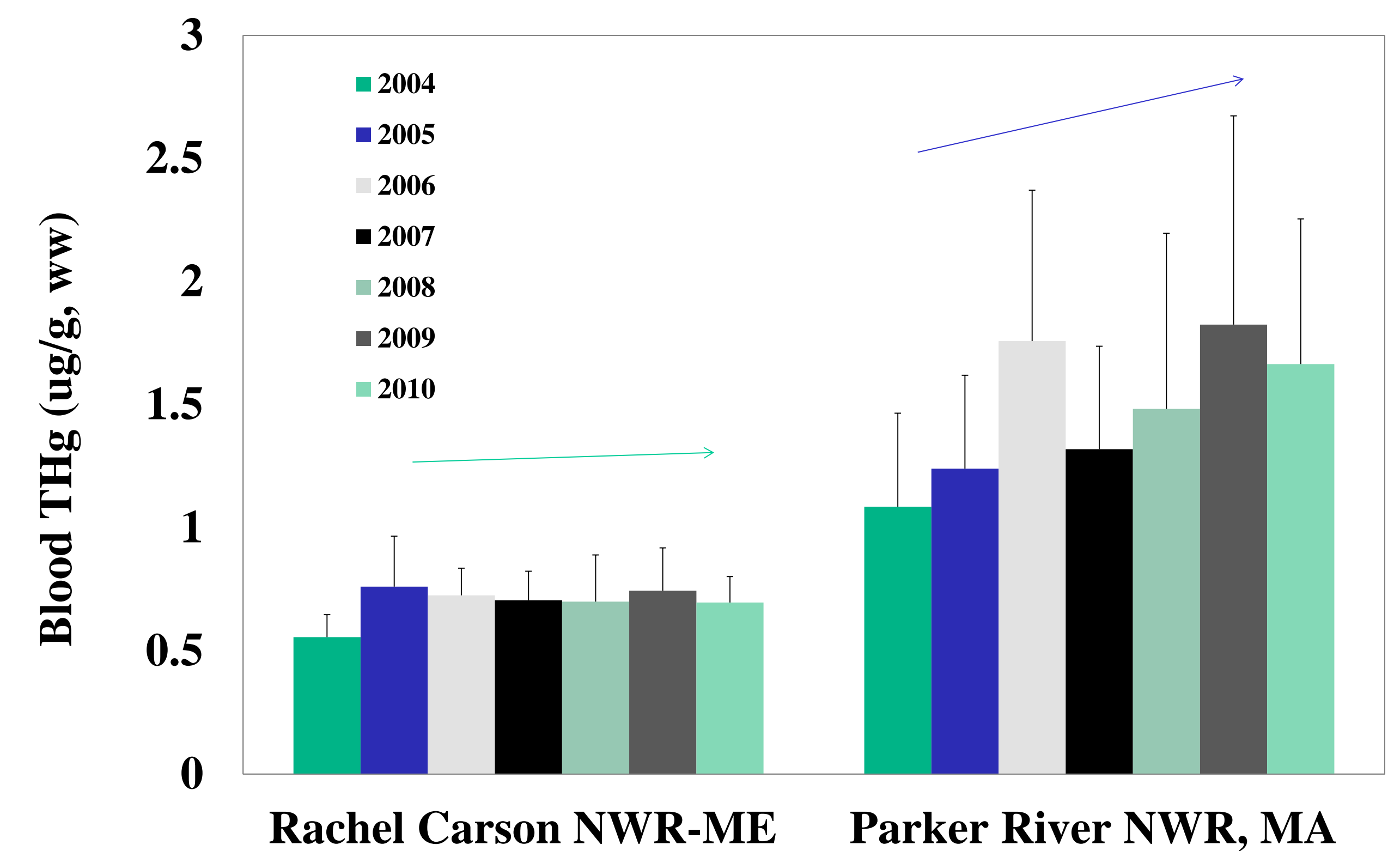


Figure 4. Annual variation in mercury levels in sparrows from Parker River NWR (MA) and Rachel Carson NWR (ME).

Ongoing Investigations

In 2009-2010, in addition to sampling saltmarsh sparrows on the breeding grounds, we collected and analyzed blood samples from birds in VA to assess mercury exposure on the wintering grounds. Mercury levels are significantly lower at southern sites (Table 1). This data must be interpreted cautiously since large areas of the wintering grounds remain unsampled.

Location	Whole Blood THg (ug/g, ww) ± std	Sample size
Chincoteague NWR, Accomack, VA	0.26 ± 0.15	33
Eastern Shore NWR, Cape Charles, VA	0.48 ± 0.22	50
Rachel Carson NWR, Wells, ME	0.74 ± 0.17	25
Parker River NWR, Plum Island, MA	1.83 ± 0.85	29

Table 1. Mean mercury levels in sparrows on breeding grounds in New England (Summer 2009) and wintering grounds in Virginia (2009-2010).

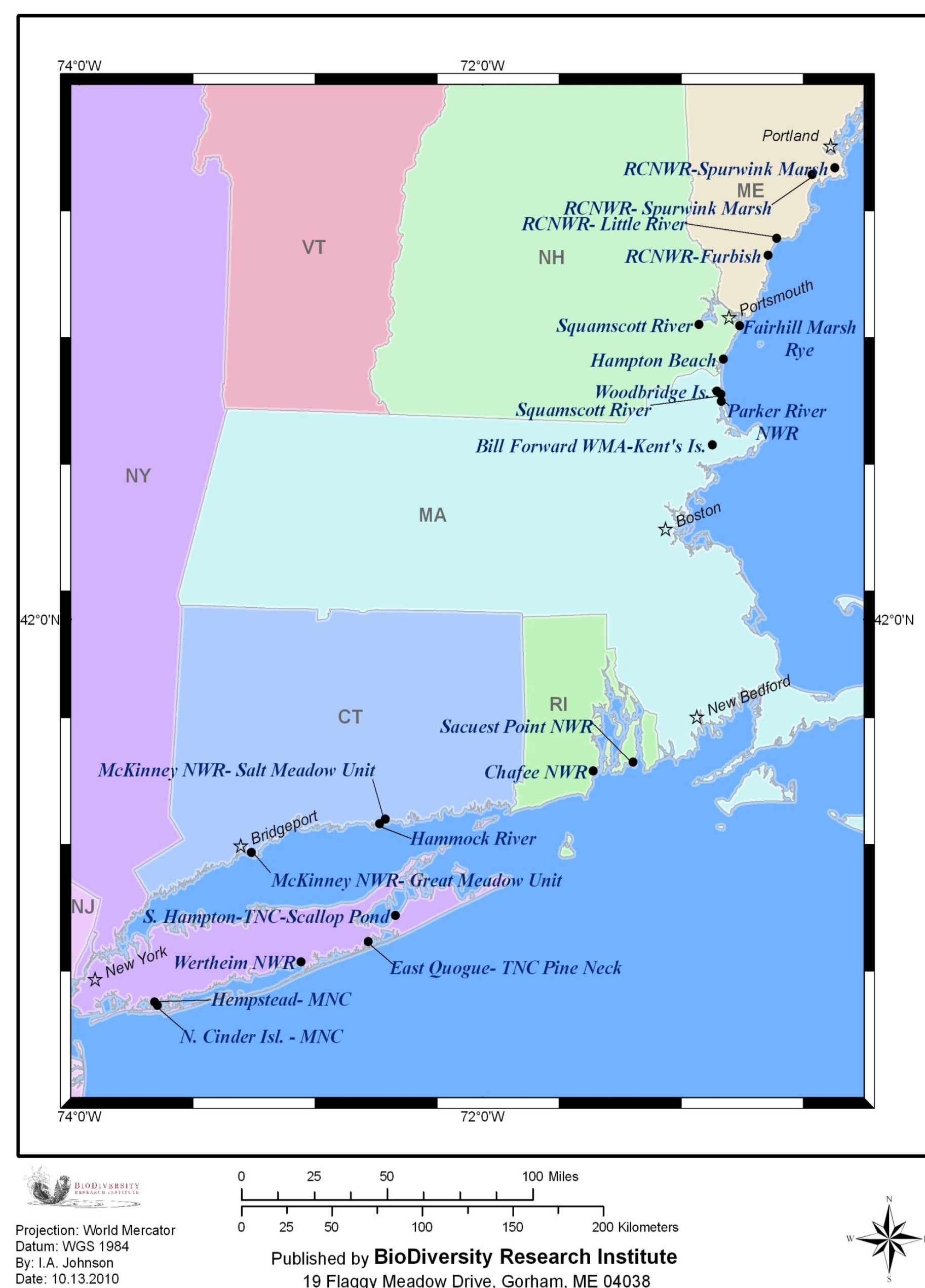


Figure 1. Location of all sites where saltmarsh sparrows were captured in the Northeast from 2004 - 2010.