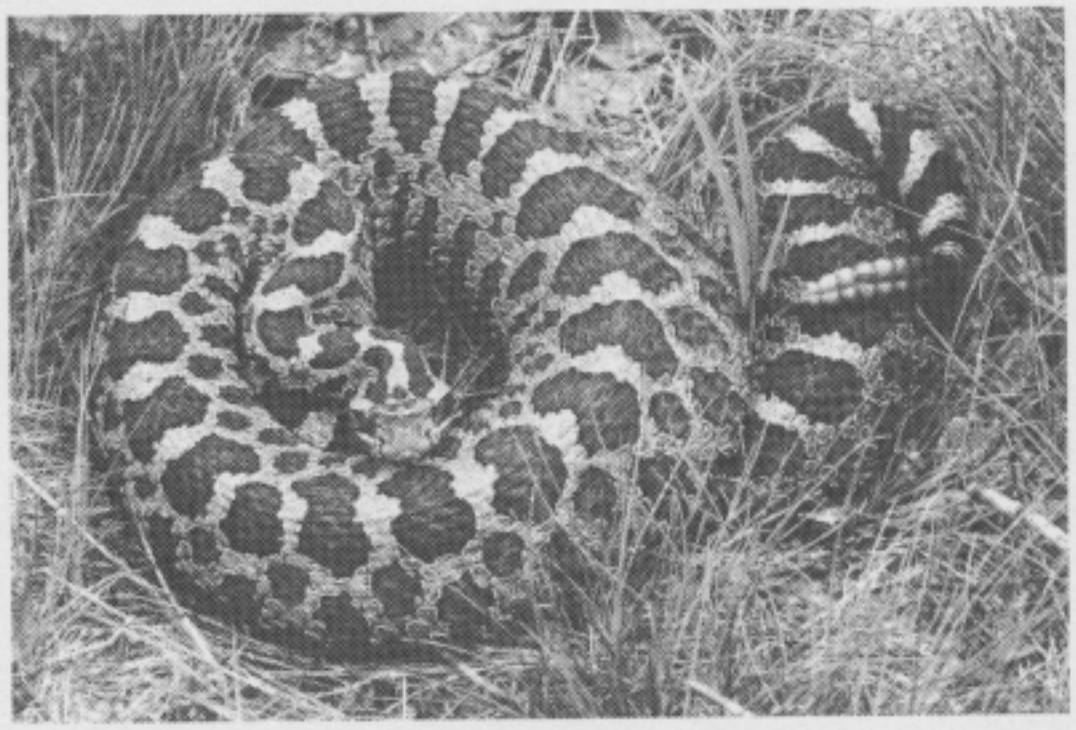
# Genetics and Disease Management of Small Populations



# GENETICS AND DISEASE MANAGEMENT OF SMALL POPULATIONS

Moderated by Kent Prior

## DISCUSSION SUMMARY

Three speakers presented during this session. Lisle Gibbs spoke about "Conservation Genetics of Eastern Massasauga Rattlesnakes." Kay Mehren spoke about "Medical Aspects of Eastern Massasauga Rattlesnake Recovery." Lastly, Anne Yagi spoke about the restoration of Wainfleet Bog. (*Editor's note: Anne Yagi's paper can be found in the "Snakes in Bog and Wetland Ecosystems" section of this publication, page 164.*)

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### *Introduction*

The fact that the three papers presented in this section describe highly specific perspectives and problems only serves to illustrate how complex and multifaceted massasauga recovery has become.

In the first paper, Lisle Gibbs (McMaster University) provides an overview of the structure of massasauga populations as understood through research on the species' population genetic composition. A series of studies of the distribution of massasauga DNA across the landscape of Ontario, New York, and Ohio suggest that this snake is highly compartmentalized - neighboring populations appear to be very isolated from one another genetically. Lisle interprets these data in a management context, providing guidance for delineating populations on the ground and hope regarding the genetic integrity of small isolated populations.

The second paper, by Kay Mehren and Graham Crawshaw (Toronto Zoo), makes a persuasive pitch for improving the degree of collaboration between wildlife veterinarians and conservation ecologists. In doing so we stand to improve our understanding of the baseline dynamics and implications of disease transmission in wild populations and how to manage the risk of cross-contamination and maintain healthy populations in captivity (e.g., zoos, captive breeding, and research collections). Lest we think these issues lack importance for massasauga conservation we should recall the near catastrophic (and plausibly human-induced) disease outbreaks that have affected desert tortoise and Aruba Island rattlesnake populations in the past few years.

Finally, Anne Yagi (Ontario Ministry of Natural Resources) provides an instructive overview of the history, significance, and plans for the restoration of Wainfleet bog, among the last peatland refuges for massasaugas. Importantly, agencies responsible for recovery and management of the bog intend to use massasaugas to effectively guide restoration protocol. Information on the habitat use and movement patterns of massasaugas at Wainfleet should enable land managers to choose among various risk-based options for bog remediation. For instance, raising the watertable in one part of the bog is likely to flood a large portion of overwintering habitat. Whereas, re-flooding another area may impact an area currently unused by massasaugas. For highly jeopardized populations like Wainfleet and Ojibway that occur in isolated habitat patches, broadening our focus from snakes seen in isolation to that of the natural communities surrounding them (peatland, tallgrass prairie) surely represents a sound ecologically-based approach and perhaps the only realistic path to recovery. Species may never be fully recovered in a piecemeal fashion. If so, those of us who regard ourselves as merely "snake ecologists" should see in ecosystem recovery a whole new world of interdisciplinary linkages opening up for us.

The potential value of such unique perspectives provided through studies of genetic structure, disease, and community ecology/restoration were scarcely considered six years ago during the first International Symposium and Workshop on the Conservation of Massasaugas (1992). I dare say that many currently unimagined perspectives and new insights will further refine our approach to massasauga recovery over the next six years.