

# **A Quest for Dragons:** ***Odonate diversity in Johnson Creek watershed***



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*The Xerces Society for Invertebrate Conservation*  
JCWC Science Symposium, 21 May 2015





# WHY DRAGONFLIES?

- ✧ Nymphs are top predators in fishless wetlands
- ✧ Link between terrestrial & aquatic food webs
- ✧ Biotope characterization





## ✧ Bioindicators

## ✧ Models to study effects of climate change

### Dragonfly community re-organisation in boreal forest lakes: rapid species turnover driven by climate change?

IDA FLENNER<sup>1,2</sup>, GÖRAN SAHLÉN<sup>1</sup>

Article first published online: 14 JUL 2008

DOI: 10.1111/j.1752-4598.2008.00020.x

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The Royal Entomological Society

Issue



**Insect Conservation and Diversity**

**Volume 1, Issue 3, pages 169–179, August 2008**

### Changing temperature regimes have advanced the phenology of Odonata in the Netherlands

NIELS J. DINGEMANSE<sup>1,\*</sup> and VINCENT J. KALKMAN<sup>2</sup>

Article first published online: 22 FEB 2008

DOI: 10.1111/j.1365-2311.2007.00982.x

Issue



**Ecological Entomology**

**Volume 33, Issue 3, pages 394–402, June 2008**

### A northward shift of range margins in British Odonata

Rachael Hickling<sup>1,2</sup>, David B. Roy<sup>1</sup>, Jane K. Hill<sup>2</sup>, Chris D. Thomas<sup>2</sup>

Article first published online: 13 JAN 2005

DOI: 10.1111/j.1365-2486.2005.00904.x

Issue

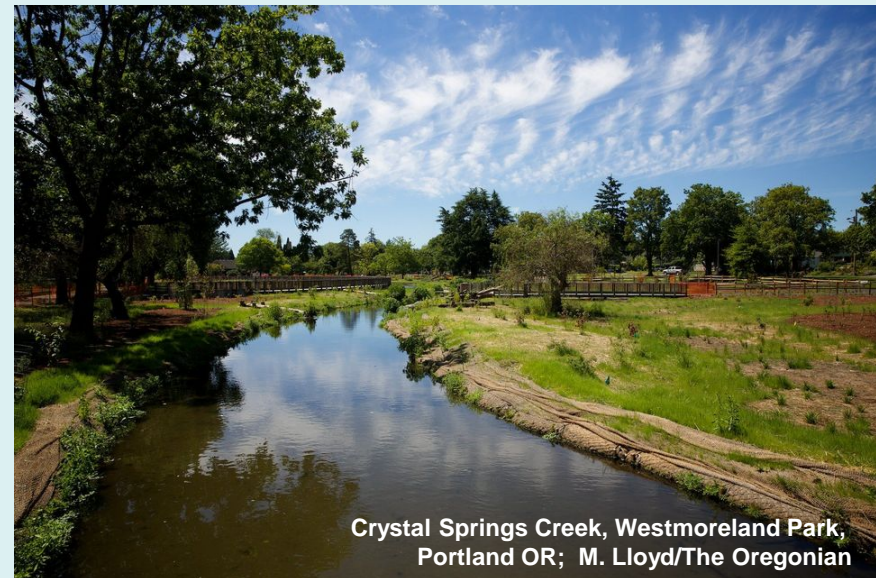


**Global Change Biology**

**Volume 11, Issue 3, pages 502–506, March 2005**



Crystal Springs Creek, Westmoreland Park,  
Portland OR; C.A.S. Mazzacano



Crystal Springs Creek, Westmoreland Park,  
Portland OR; M. Lloyd/The Oregonian





Food resource







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# WHY DRAGONFLIES?



Oregon Spotted Frog,  
C.A.S. Mazzacano



Backswimmer;  
Stephen Luk



Salamander,  
C.A.S. Mazzacano



Tule Bluet (*Enallagma carunculatum*);  
C.A.S. Mazzacano



Darter nymph,  
Alexa Carleton



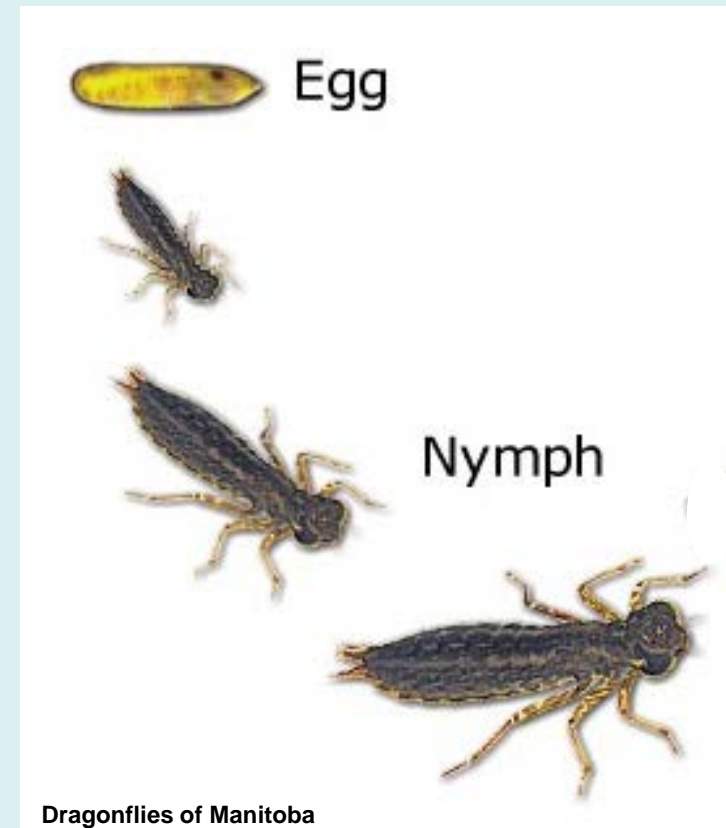
Predaceous diving beetle,  
C.A.S. Mazzacano

Part of a suite  
of natural  
enemies that  
helps control  
mosquitos



# A PROJECT DEVELOPS

- ✧ Years of incidental observation suggest Johnson Creek mainstem is strangely devoid of odonates
- ✧ Westmoreland Park post-restoration → more species in 3 hours than in past 3 years
- ✧ Observations of migratory species at park → good Pond Watch locality for Migratory Dragonfly Partnership





Survey adults & nymphs at Westmoreland Park March through October to:

- ✧ Monitor odonate diversity throughout the season
- ✧ Assess resident & migrant members of migratory species (Pond Watch)
- ✧ Correlate nymph & adult populations (reproductive sinks?)
- ✧ Compare diversity to other sites in Johnson Cr. watershed



*Libellula* emergence;  
C.A.S. Mazzacano



- ✧ Alternate weekly surveys of adults and nymphs
- ✧ Aquatic samples:
  - eight 1-ft<sup>2</sup> D-net sets along 830 ft (250 m) reach
  - 4 each from wetland and stream
  - count nymphs, save subset for ID, note additional invertebrates



C.A.S. Mazzacano







- ✧ Adult surveys:
- slow visual surveys through stream, wetland, upland
  - photo vouchers; ID in-hand as needed
  - specimen vouchers of new/unexpected species



*Ischnura cervula* (Pacific Forktail);  
C.A.S. Mazzacano







# RESULTS (so far?)

✧ Adult odonates 1<sup>st</sup> sighted  
March 26

- overwintered nymphs of *Ischnura cervula* that completed development
- teneral & mature adults



*Ischnura cervula* (Pacific Forktail) male;  
C.A.S. Mazzacano



*Ischnura cervula* (Pacific Forktail) immature  
female; C.A.S. Mazzacano





# RESULTS (so far?)

- ✧ Adult dragonflies 1<sup>st</sup> seen  
April 9 (*Sympetrum corruptum*)  
& April 20 (*Anax junius*)
  - migrants returning north  
from wintering grounds



*Anax junius* (Common Green Darner);  
C.A.S. Mazzacano



*Sympetrum corruptum* (Variegated  
Meadowhawk); C.A.S. Mazzacano

- ✧ Much mating & oviposition in  
early *Anax*; only patrolling  
males in early *S. corruptum*





# RESULTS (so far?)



C.A.S. Mazzacano

- ✧ Damselfly nymphs in aquatic samples starting on April 12
- ✧ No dragonfly nymphs or exuviae yet as of May 15



C.A.S. Mazzacano



C.A.S. Mazzacano





# RESULTS (so far?)

Additional species almost weekly in spring,  
including some not seen prior to restoration

*Sympetrum illotum* (Cardinal Meadowhawk);  
C.A.S. Mazzacano



*Enallagma carunculatum*  
(Tule Bluet); C.A.S. Mazzacano







## RESULTS (so far?)

Aquatic macroinvertebrate community dominated by a few common, tolerant types: Water Boatmen (Corixidae), Scuds (Amphipoda), Bloodworms (*Chironomus*)



Alderflies (*Sialis*) most abundant large predators







# RESULTS (so far?)

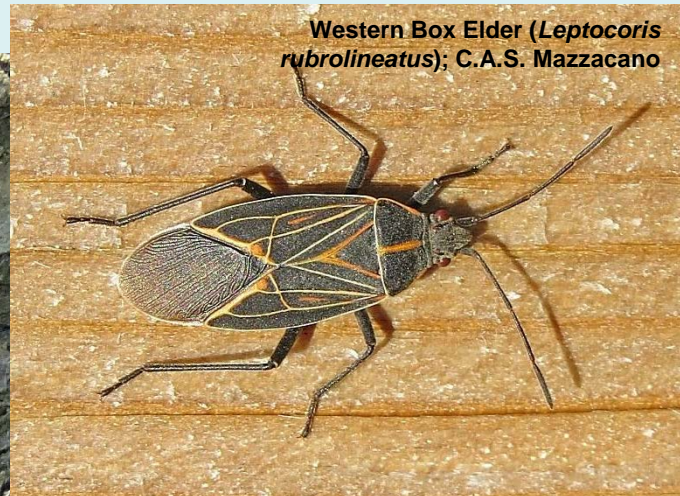
## A variety of other interesting invertebrates



*Polistes dominula* (European Paper wasp); C.A.S. Mazzacano



*Vanessa atalanta* (Red Admiral); C.A.S. Mazzacano



Western Box Elder (*Leptocoris rubrolineatus*); C.A.S. Mazzacano



*Phidippus audax* (Bold Jumper); C.A.S. Mazzacano



*Salticus scenicus* (Zebra Jumper); C.A.S. Mazzacano



*Sialis* (Alderfly); C.A.S. Mazzacano



- ✧ Monitor multiple years to detect community-level changes
- ✧ Examine additional sites on Johnson Cr. to compare odonate diversity



*Erythemis collocata* (Western Pondhawk); C.A.S. Mazzacano



*Libellula forensis* (Eight-spotted Skimmer); C.A.S. Mazzacano



*Sympetrum pallipes* (Striped Meadowhawk); C.A.S. Mazzacano



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# Acknowledgements

## PARTNERS



## FUNDERS



Special thanks to Betsy Redfearn (PP&R)  
for help with permits and access!