

Jun 22nd, 2:30 PM - 2:45 PM

## Session A2: From Banging Your Head into a Tidal Barrier to Migration Further Upstream. Migration Doesn't Stop at the Coastline

Peter Paul Schollema  
*Regional Water Authority Hunze en Aa's*

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Schollema, Peter Paul, "Session A2: From Banging Your Head into a Tidal Barrier to Migration Further Upstream. Migration Doesn't Stop at the Coastline" (2015). *International Conference on Engineering and Ecohydrology for Fish Passage*. 15.  
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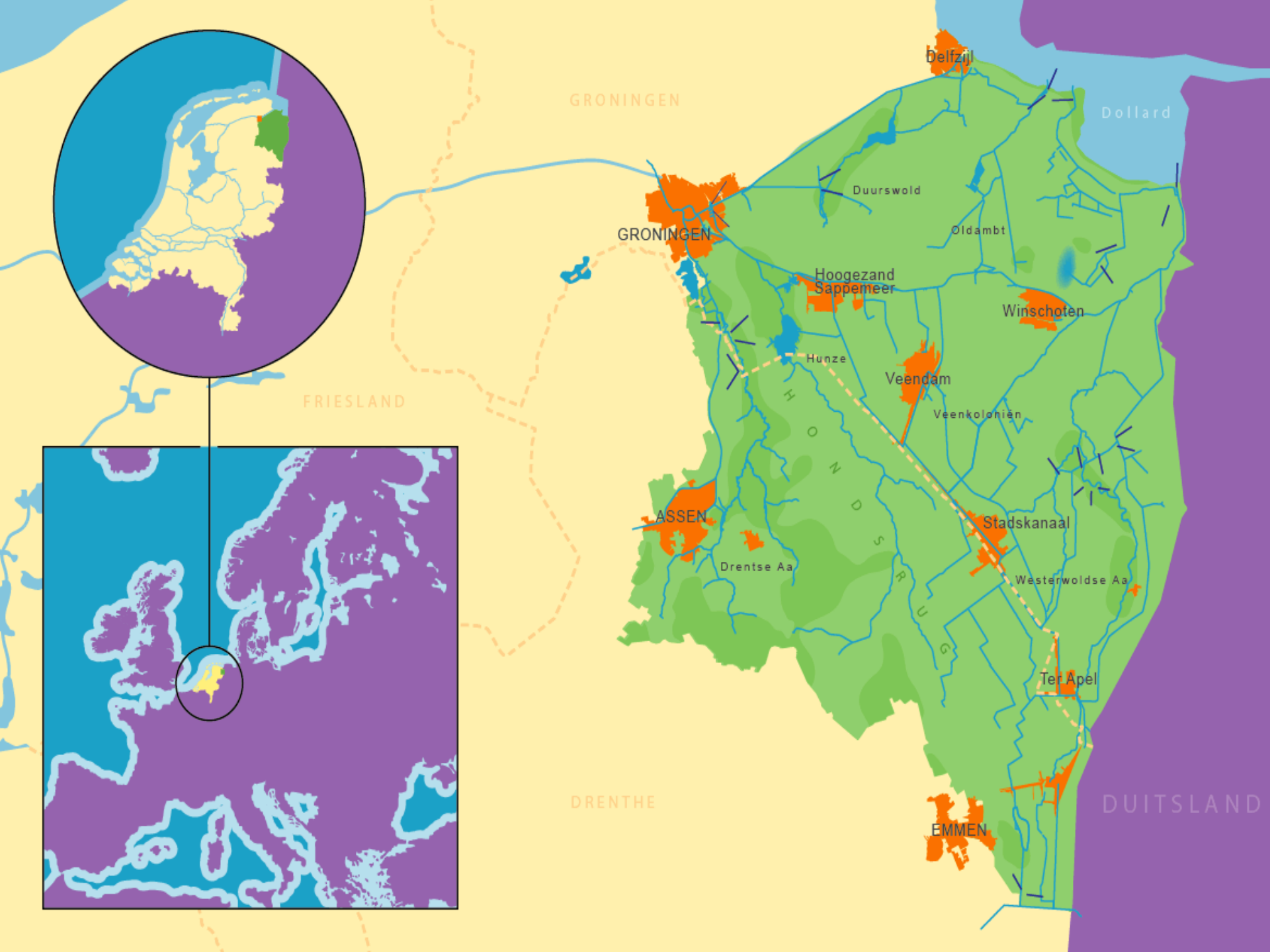
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Peter Paul Schollema  
Regional Water Authority Hunze en Aa's



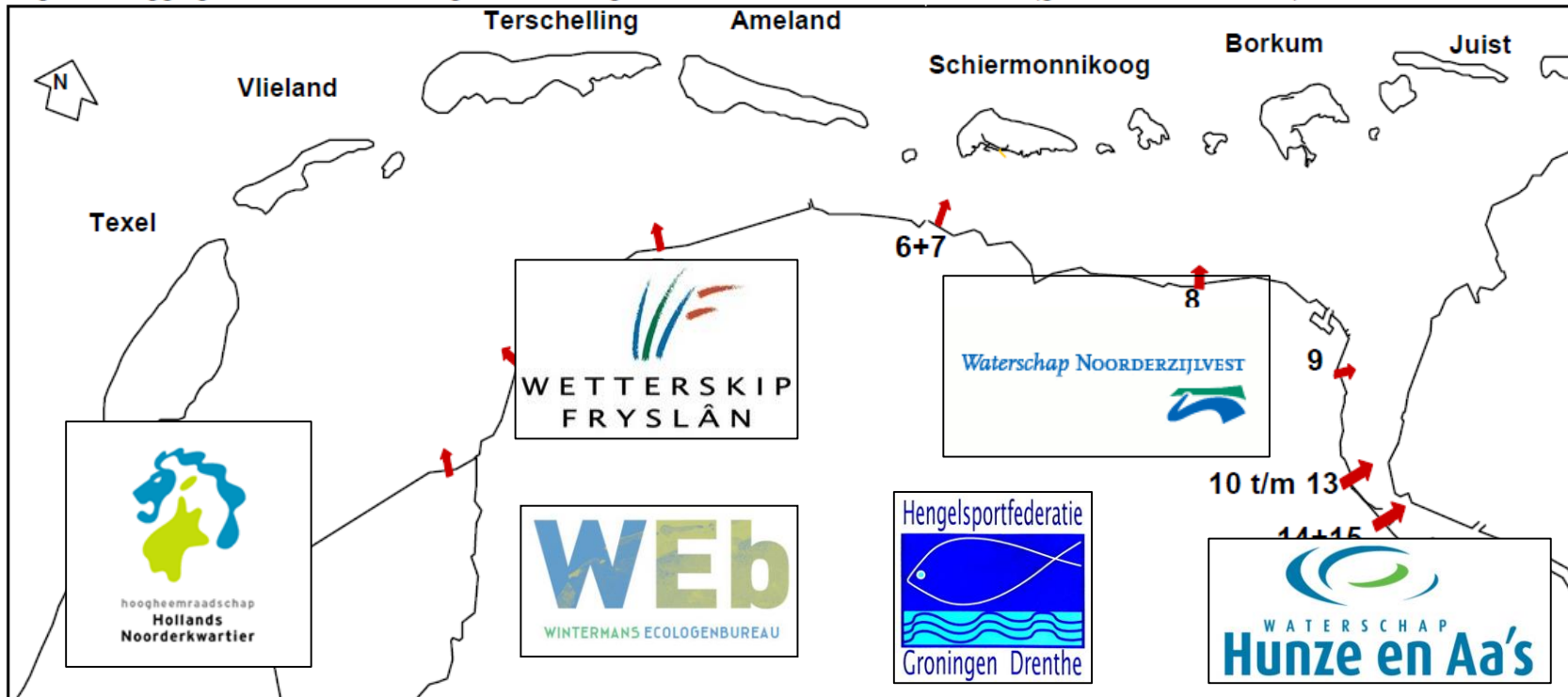


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## Sampling of diadromous fish



# Locations



Van Den Helder tot Nieuwe Statenzijl: 17 bemonsteringslocaties

- |                   |                     |                     |                      |
|-------------------|---------------------|---------------------|----------------------|
| 1 Den Helder west | 6 Lauwersoog spui   | 11 Eemskanaal spui  | 16 Breebaart         |
| 2 Den Helder oost | 7 Lauwersoog schut  | 12 Duurswold        | 17 Nieuwe Statenzijl |
| 3 Harlingen       | 8 Noorderpolderzijl | 13 Eemskanaal schut |                      |
| 4 Roptazijl       | 9 Spijksterpompen   | 14 Termunterzijl    |                      |
| 5 Zwarte Haan     | 10 Damssterdiep     | 15 De Fiemel        |                      |



## 130 colleagues and volunteers!

Rik Beentjes, Rens de Jong, Ton Keuris, Frans Nannes en Hans Roodzand, Adri de Boer, Albert Boonstra, Allix Brenninkmeijer, Arjan van Velsen, Auke Vochteloo, Baukje de Boer-Draaisma, Ben Willems, Bregtje Kuik, Dick van Dijk, Durk Noordmans, Durk Torensma, Edwin Wisse, Eize van Ommen, Emmy Veeman, Eric Rozema, Eus de Groot, Evert Bakker, Fokko Barns, Folkert Reitsma, Froukje Sikking, Geartsje Breimer, Gerrit Rijpkema, Humphry Paap, Hans Boersma, Hans Gerritsen, Henk de Boer, Hendrik Hoekstra, Henk Germeraad, Henk Sikma, Izaak de Vries, Jaap Feddema, Jacobus Zwart, Jan Annema, Jan Hoekstra, Jan van der Broek, Jean-Pierre Brehen, Job Geubel, Joca Jansen, Johan Enting, Johan Helmus, Johan Zijlstra, Johannes Ferwerda, John Melis, Jurjen Breimer, J. Koele, Klaas Kuiken, Liekel Sijsinga, Maaïke Kuiken, Maarten van der Beek, Marc Nederlof, Mattie van der Meer, Minne Boersma, Nico Huisman, Nico Kalt, Nienke de Jong, Nienke Hamstra, Oane Buwalda, Peter Bodenstaff, Peter de Boer, Philip Roorda, Pier Schaper, Remco Hiemstra, Richard Feenstra, Riens Buwalda, Rommert Cazemier, Ronald Draaijer, Ronald Ros, Ronald Visser, Sandra van Strien, Sake Cnossen, Siebold Krol, Sjoerd Boonstra, Sven Bergraat, Teddy Dolstra, Teun Tamsma, Thomas van Booma, W(atse) Kamminga, Wijbren Heidstra, Willem Helmus, Wim Meijer, Wim Ypma en Winus van der Helden. Marc Barthelds, Piet van den Bemd, Fré Buurman, Bé Feikens, Arno Folkers, Roelof Groenewoud, Marlous Heemstra, Koos Hektor, Roy van Hezel, Hennie Huttinga, Bert Keizer, Anton Kloosterboer, Koen Köller, Johan Kruger, Wubbo Kruit, Ebel Kort, Evert van der Laan, Jeroen Meeuse, Henk Meirink, Helmer Modderman, Huib Moret, Derk Nieuwenhuis, Willem Poelman, Anne Post, Gille Postma, Henk Schol, Peter-Paul Schollema, Eelke Schoppers, Jan Schoonveld, Henk Siekman, K. Stoppels, Hark Tjaden, Jos Veneberg en Jan Wezeman.



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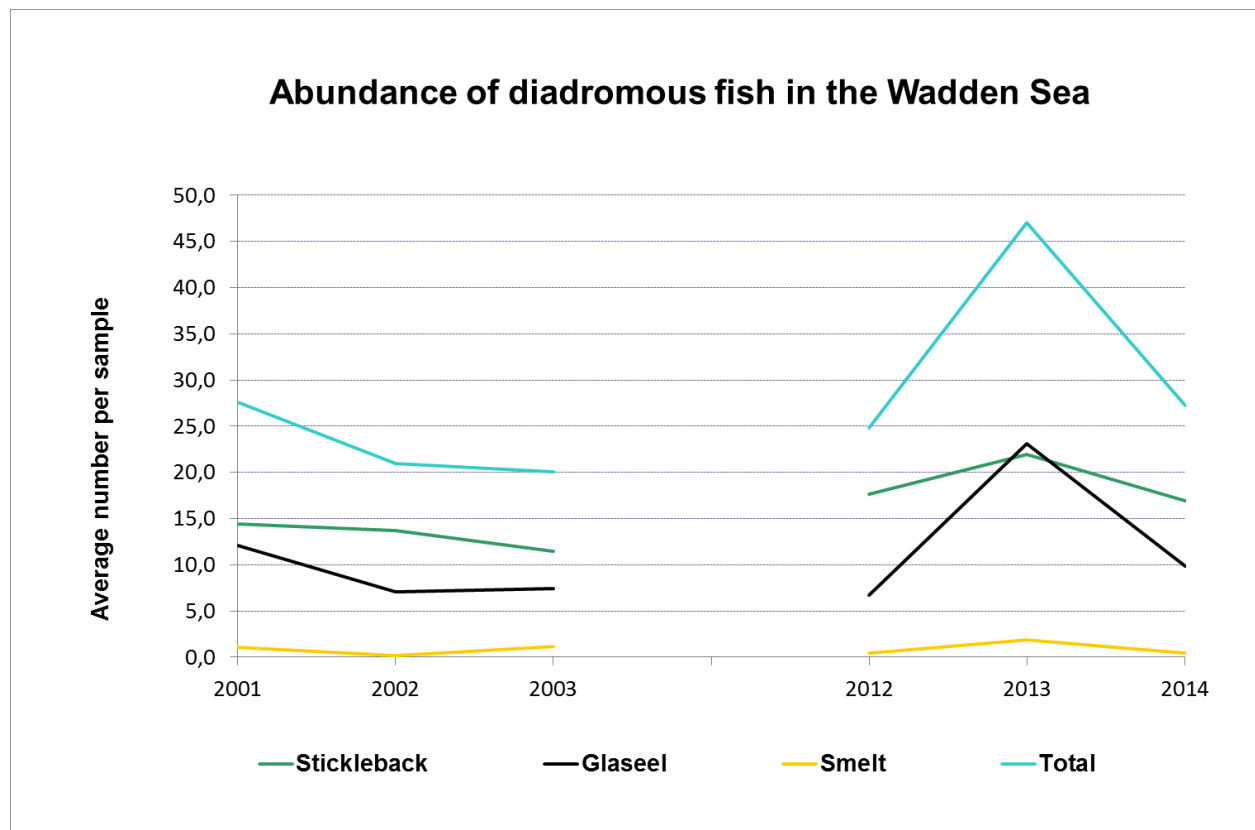


# Method



- Glaseel net 1x1m
- Mesh size 1 mm
- 15 February – 30 June
- 2 samples a week
- 0 -2 hrs before high tide





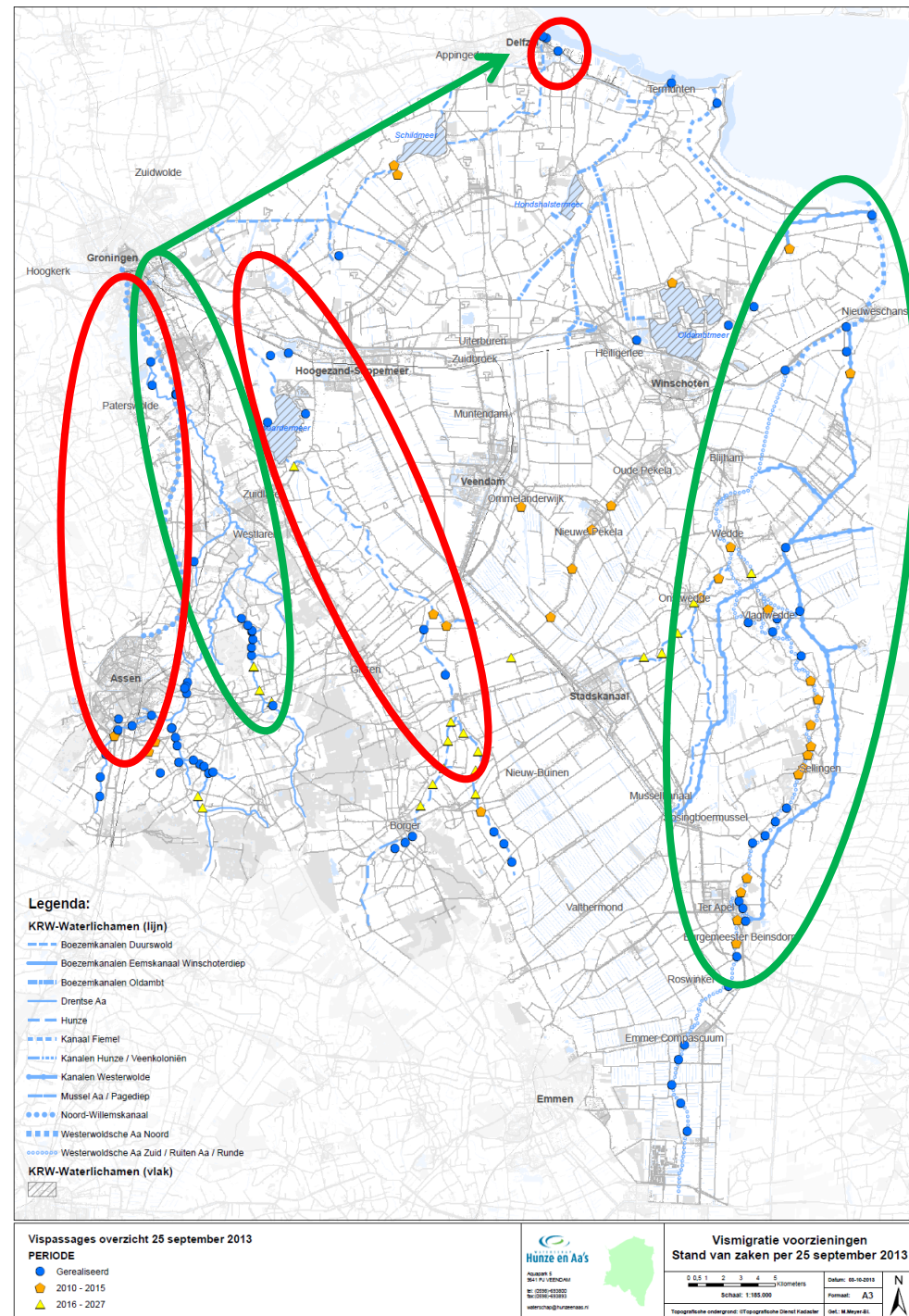
Diadromous fish	2001	2002	2003	2012	2013	2014
Stickleback	14,4	13,7	11,5	17,6	22,0	16,9
Glaseel	12,1	7,1	7,4	6,7	23,1	9,9
Smelt	1,1	0,2	1,2	0,5	1,9	0,5
Total	27,6	21,0	20,1	24,8	47,0	27,3





# Tagging studies

- R. Drentse Aa (Lamprey, Silvereel)
- R. Hunze (Ide, Eel)
- R. WW-Aa (Eel, Stickleback)
- Pumping station Duurswold (Silvereel)
- Noord-Willemskanaal (Carp)



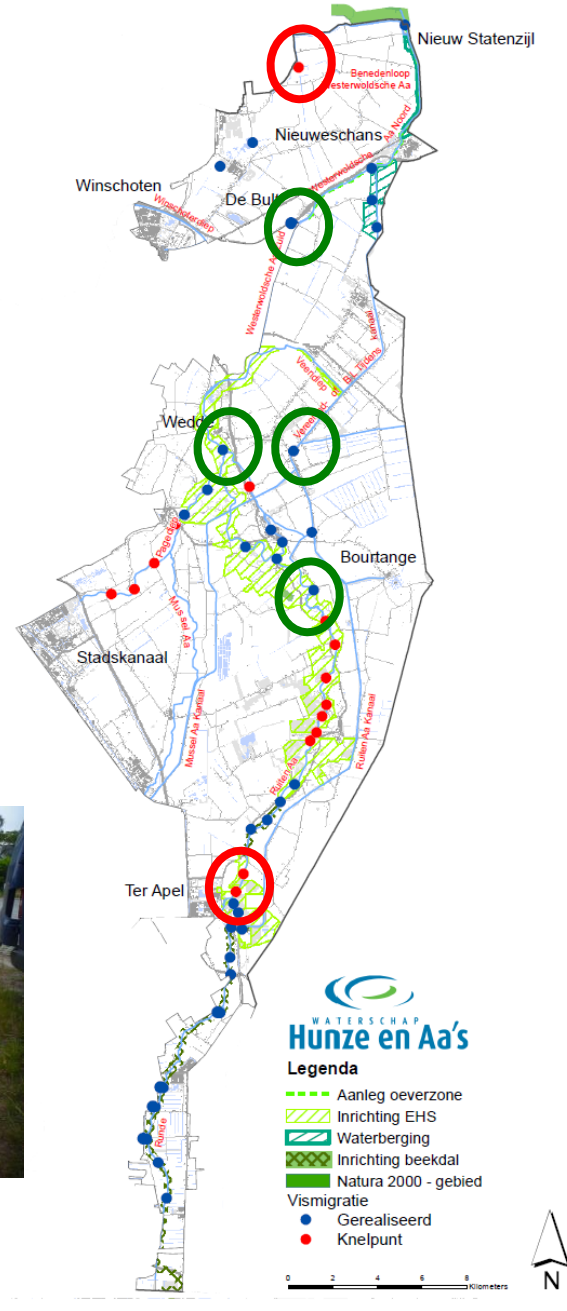
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# PIT-tag Westerwoldse Aa

- Passage efficiency
- Use of the catchment



Stroomgebied Westerwolde

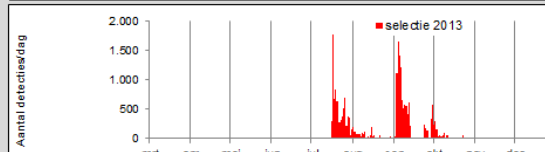
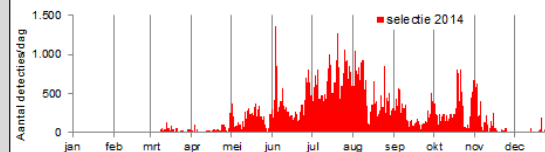
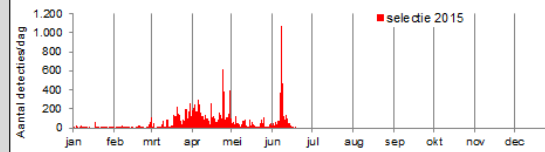
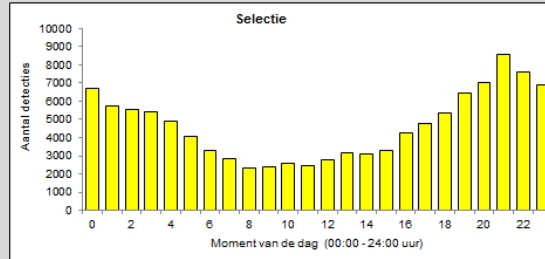
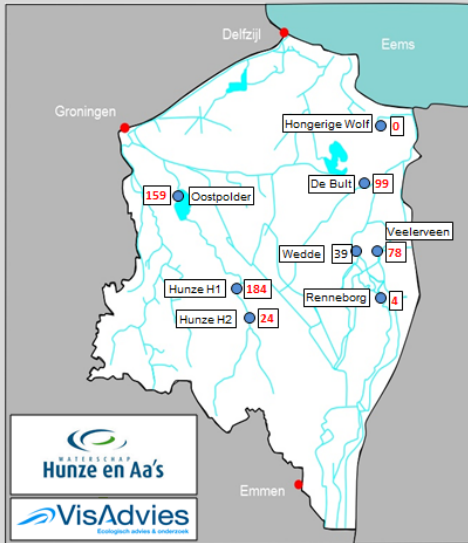




Microsoft Excel - VIS module\_20150619

Klik op de blauwe knop om de selectie te starten. Op basis van de selectie wordt het aantal geregistreerde vissen per station weergegeven op de kaart.

Toont toelichting gebruik



Bewerkmodus inschakelen  
 Bewerkmodus uitschakelen

VIS

Proefdieren | Stations en detecties

Vissoort  
 alle Verwerk

Uitzetlocatie  
 alle Verwerk

Uitzetdatum  
 alle Verwerk

Tag nummer  
 alle Verwerk

VIS\_2.0 Uitzetlocaties en terugvangsten Merkggegevens ruwe data (o.b.v. selectie) Logboek stations

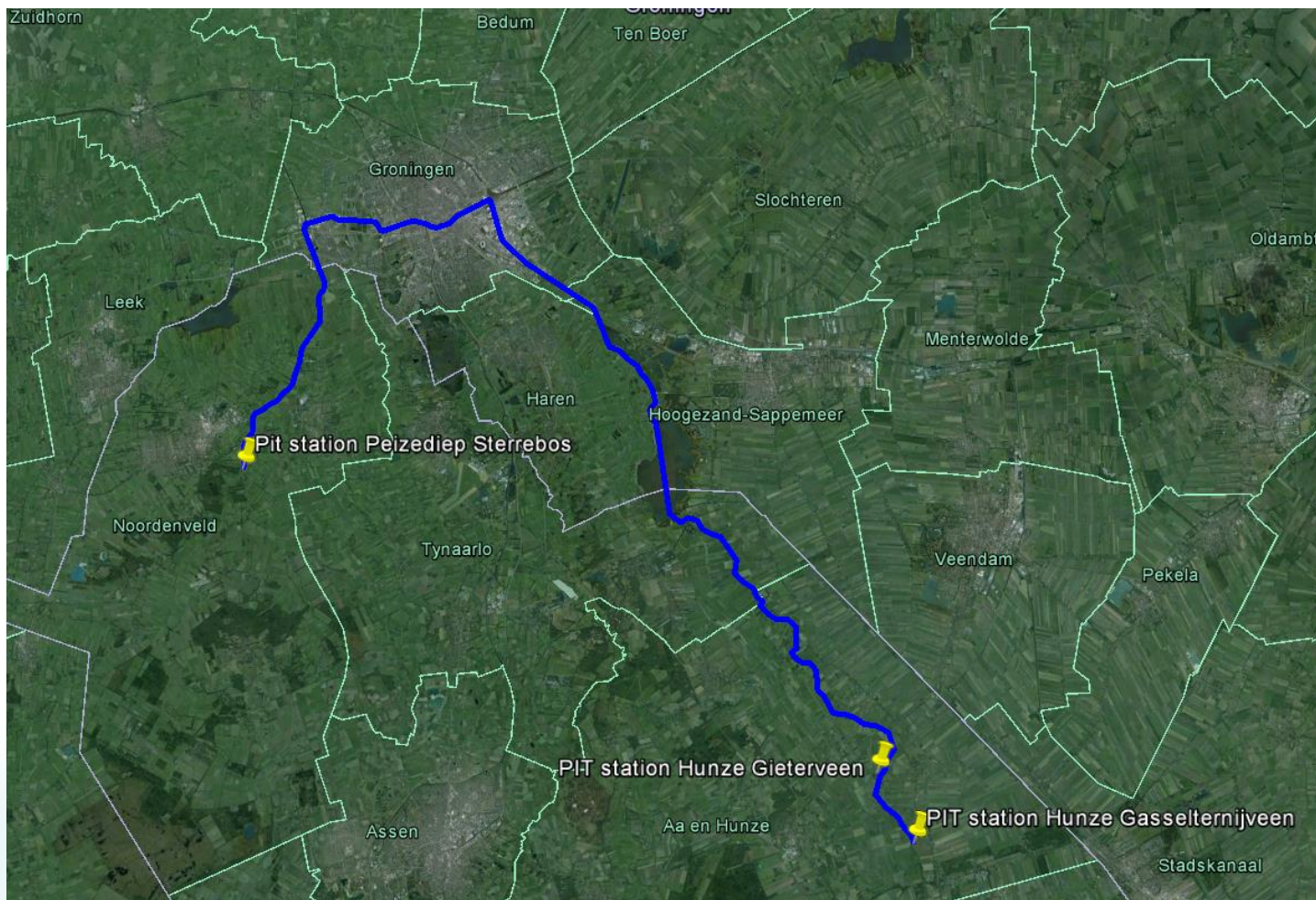
Gereed



70% 21:37 19-6-2015



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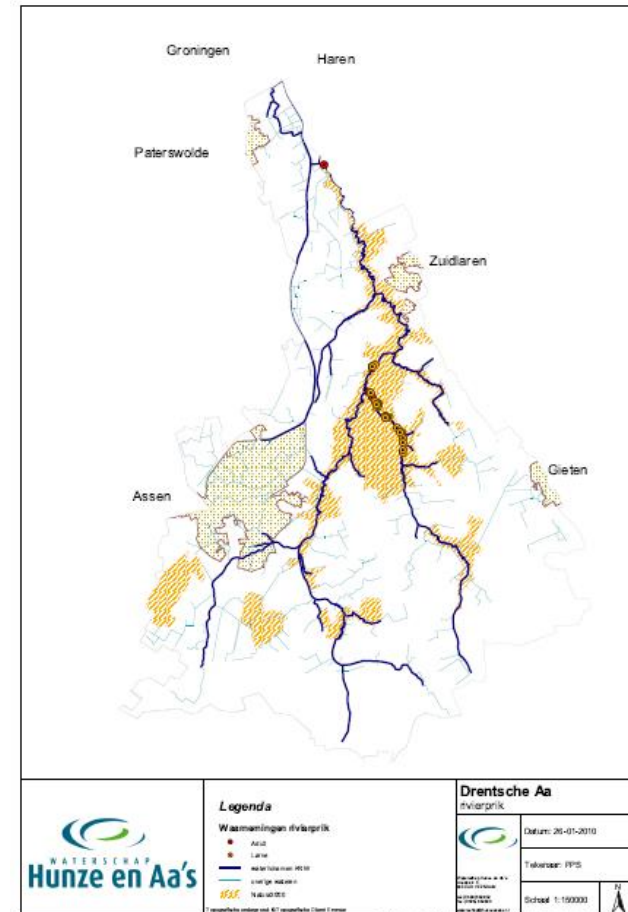


# River lamprey → N2000

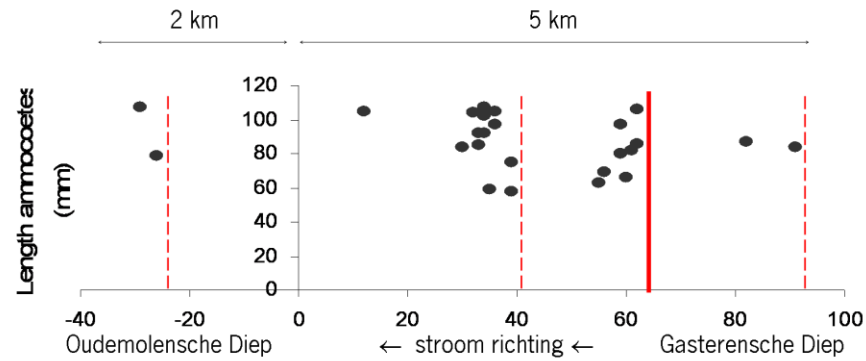
Goal: Protecting the present population.

Sounds easy → But.....

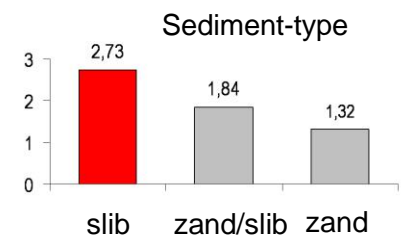
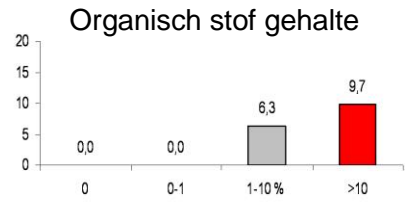
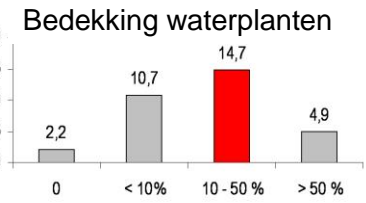
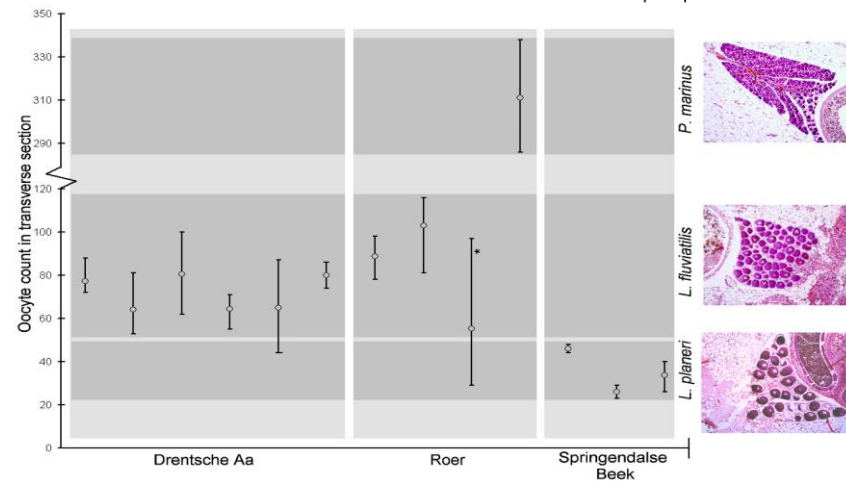
- What is the size of the current population?
- Success rate migration?
- Problems on the route?
- Use of habitat by the juveniles?



# Habitat studies



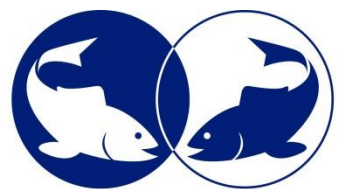
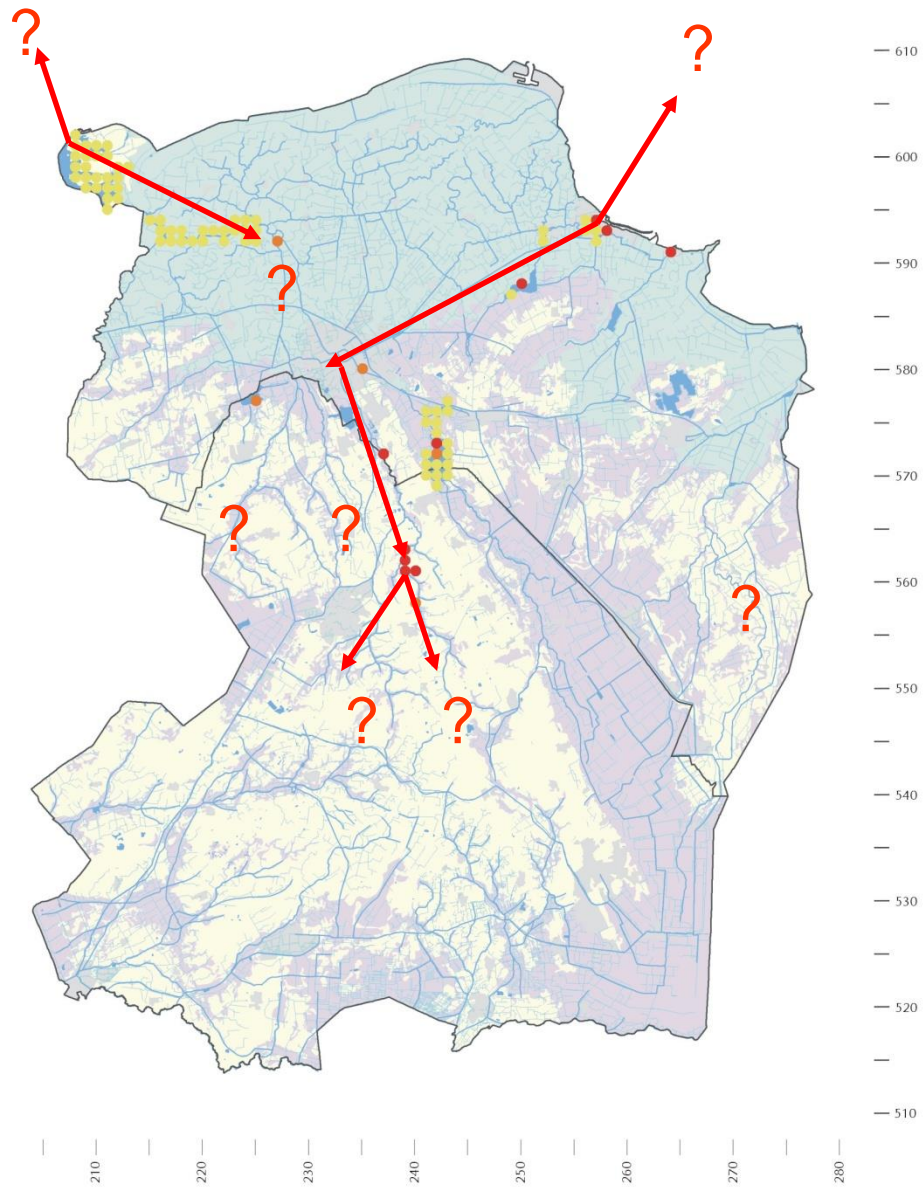
— Bekende paaiplaatsen  
 - - - Potentiële paaiplaatsen



# Migration routes

Observed on many locations...But where do they go to...?

What happens allong the route?



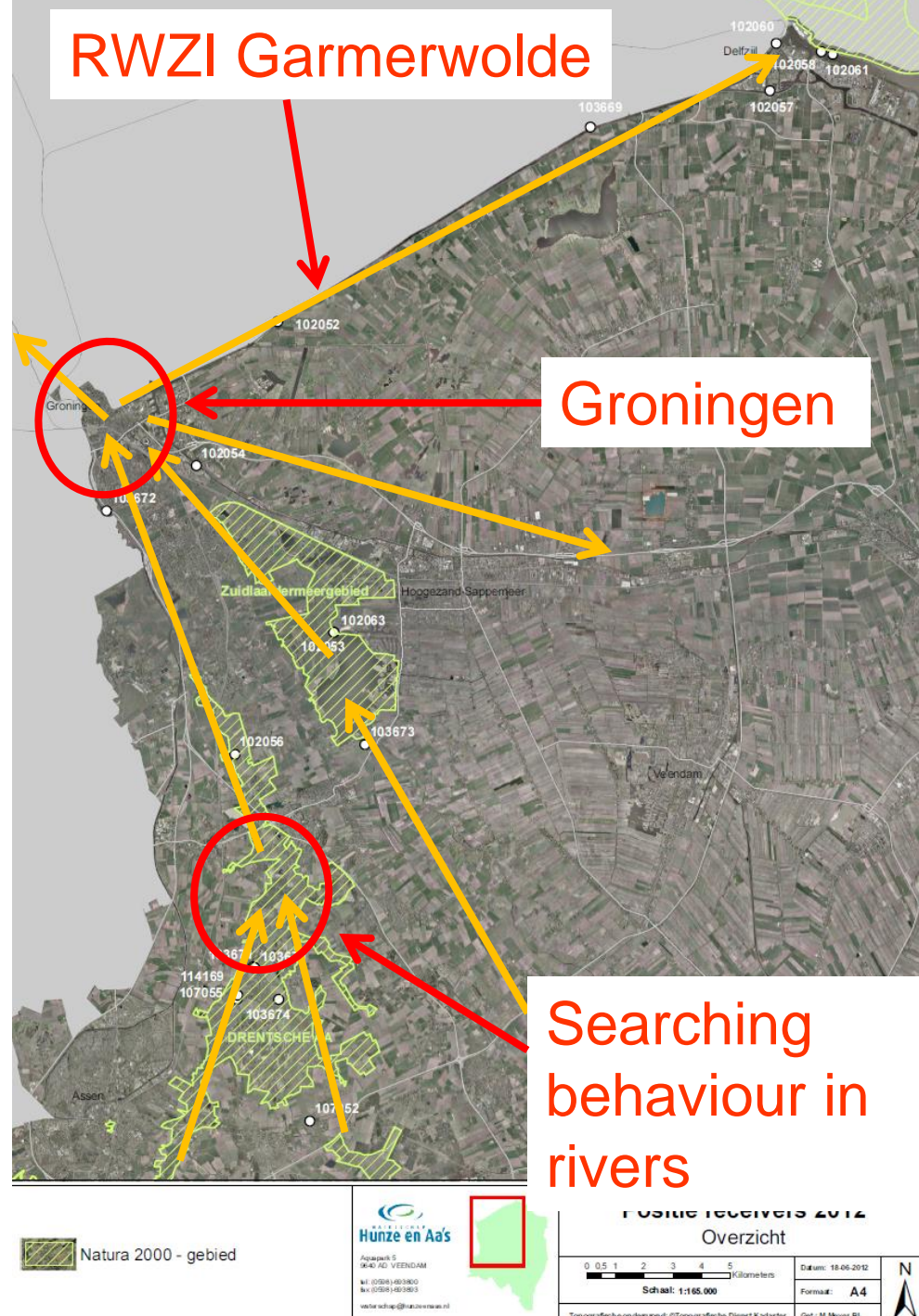
- waarnemingen van beroepsvissers en sportvissers
- meren en plassen
- noordelijk zeekleigebied
- waarnemingen uit visserijkundige onderzoeken
- woonkern
- noordelijk veengebied
- 1980-1999
- hoofdwatergang
- noordelijk zandgebied
- 2000-2007
- overige watergangen

# Looking at...

Natural lower reach of the river disappeared & unnatural water flow directions in the city of Groningen

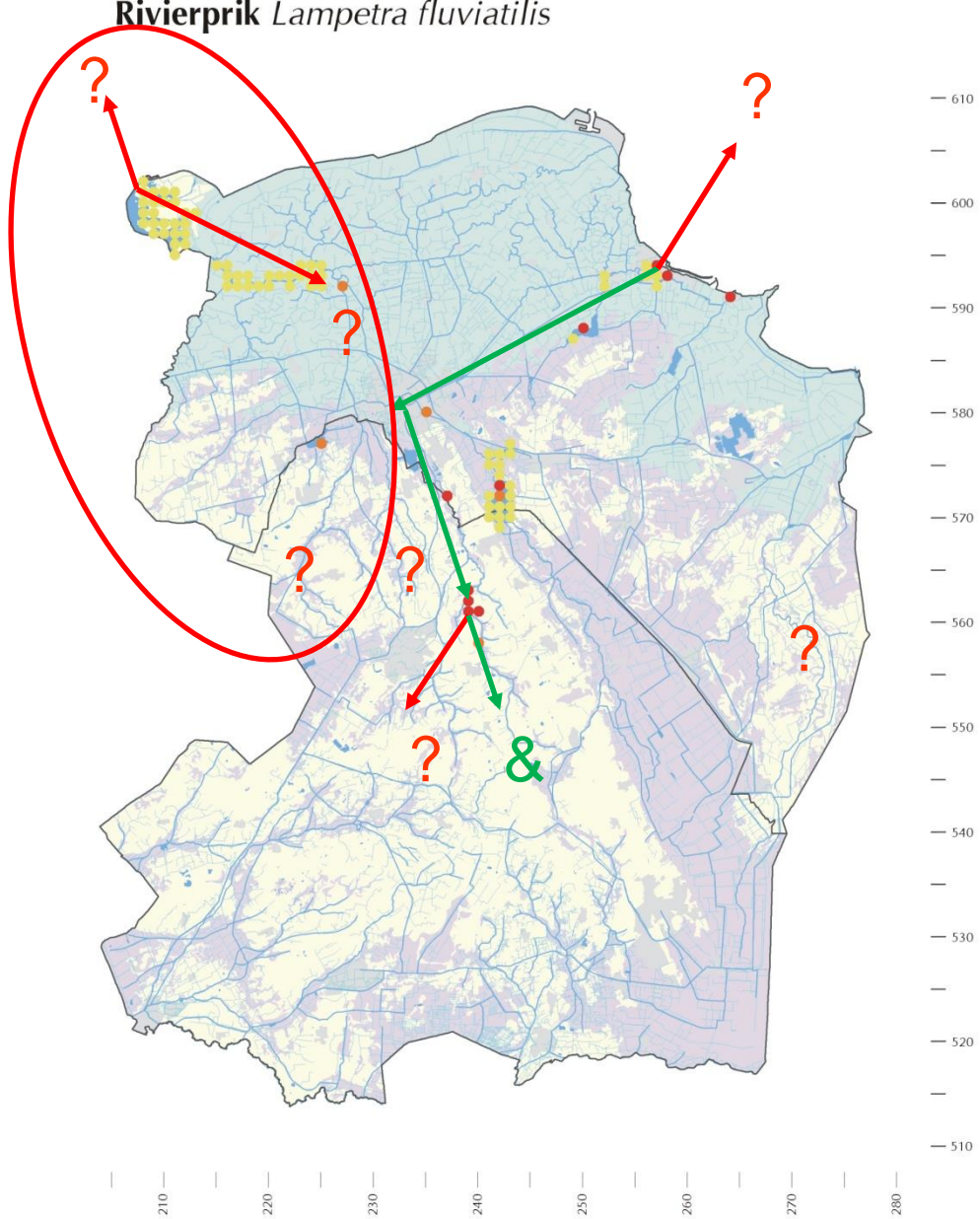
Discharge location RWZI Garmerwolde → Does the flume work as a barrier?

Searching behaviour in rivers?





# Rivierprik *Lampetra fluviatilis*

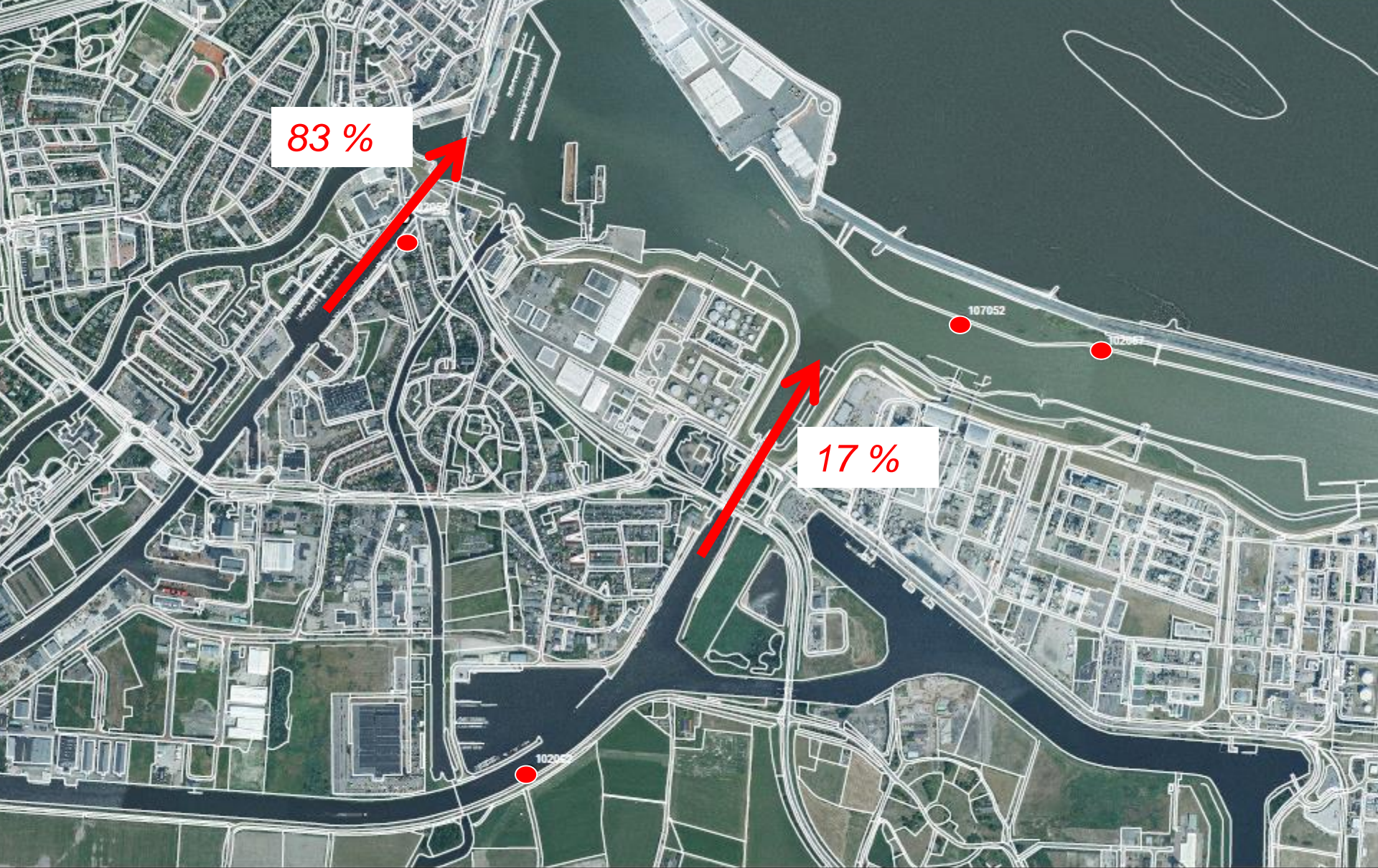


- waarnemingen van beroepsvissers en sportvissers
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- 2000-2007
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- noordelijk zeekleigebied
- noordelijk veengebied
- noordelijk zandgebied

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Downstream migration → Silver Eel





Receiver



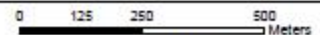
Aquapark 5  
3640 AD VEENDAM

Nr: (0504)-623900  
Fax: (0504)-623925

waterschap@hunzenaas.nl



### Positie receivers Delfzijl



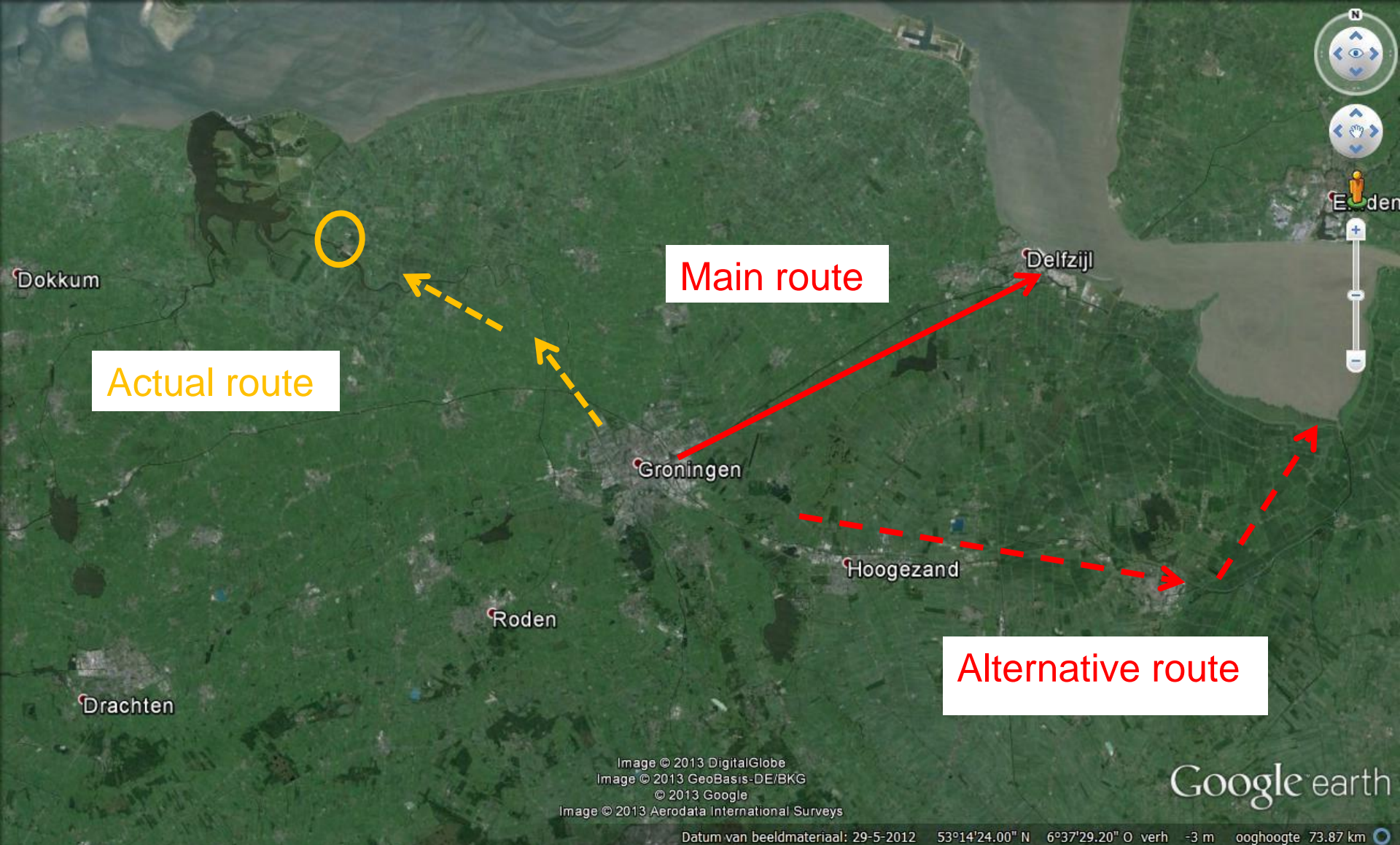
Schaal: 1:16.000

Datum: 13-01-2010

Formaat: **A4**

Topografische ondergrond: ©Topografische Dienst Kadaster

Get.: M.Meyer-St.



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