Species Protection Plan for *Aeshna viridis*

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Introduction

The Netherlands is a country which has been largely shaped by water and the reclamation of wet areas (NVL, 2002). Therefore, it is not surprising that the relatively large number of seventy dragonfly species occur, even though it is a small country (NVL, 2002). Some of these species are rare or have become rare, not only in the Netherlands; they need conservation measures. One of the ways to secure the protection of a species is through a species protection plan. In the Netherlands, species protection plans have been developed since 1984. The first Dutch species protection plan for a dragonfly was published in 2001 (De Jong & Verbeek, 2001), for the rare and threatened Green Hawker, *Aeshna viridis* (figure 1).

In the Netherlands, the occurrence of *A. viridis* is strongly related to the occurrence of the plant Water Soldier (*Stratiotes aloïdes)*, the only plant in which *A. viridis* lays its eggs. Therefore the species protection plan is based on the dependency of *A. viridis* on *S. aloïdes*. Moreover, it is a protection plan for both the dragonfly and the plant, aimed to protect two threatened species of peatland areas (de Jong, 2000). Here, we present an overview of the activities associated with this plan (figure 2).

Although the protection plan was later presented nationally, it was preceded by a plan developed by the province of Utrecht. The plan aimed to protect two threatened species of peatland

Figure 1. Aeshna viridis *is about 7 cm long and can be seen in July and August (Photo: J. Bouwman).*

Figure 2. The Dutch Species Protection Plan for A. viridis.

areas in that province, namely the plant *Stratiotes aloïdes* and dragonfly *A. viridis* (DE JONG, 2000).
The national plan was written by two environmental consultancy agencies that had been assigned this task by the Ministry of Agriculture, Nature and Food Quality. The plan brought about a collaboration between Dutch Butterfly Conservation and the province of Utrecht. The province coordinates the plan, and both organisations communicate on what to do, initiating projects in which they often collaborate with other organisations.

Distribution and ecology of Aeshna viridis and Stratiotes aloïdes

The basis for a species protection plan is good knowledge of the species' distribution and ecology. Information on the distribution and ecology of *A. viridis* and *S. aloïdes* was subjected to a thorough analysis in order to identify possible key factors determining their limited distribution in the Netherlands.

A. viridis is widely distributed in Asia, but in Europe it is relatively rare, only occurring in a few countries (IUCN, 2006). Although absent from Belgium and the United Kingdom, it does occur in Germany; the species is at present restricted to a few areas near Bremen, with a few scattered observations elsewhere (NVL, 2002; EWERS, 1999). In the Netherlands, *A. viridis* is often found together with *S. aloïdes.* However, *A. viridis* doesn't occur in every area where *S. aloïdes* occurs (figures 3 and 4). In areas with brackish water, *A.viridis* may be absent, the plant being somewhat more salt-tolerant than the dragonfly. Both species occur in large areas of peatland, either at the edge of infiltration areas where seepage occurs, or in areas where hundreds of years ago, the sea created wide basins where peat could form.

Because of the depency of *A. viridis* on *S. aloïdes*, the protection of the dragonfly can be simplified by protecting its habitat, mats of *S. aloïdes*. However, suitable conditions for *S. aloïdes* are difficult to define in the Netherlands. Although documentation about the earlier distribution of *S. aloïdes* helps to define potentially suitable conditions, predictions of suitable localities are often best related to water quality. Therefore water quality is given much attention in this species protection plan. Influence of seepage enhances suitability, but presence of good surface water can create suitable conditions as well. Dutch Butterfly Conservation has carried out about eighty experiments in six provinces observing these plants in enclosures. Although this gave good information about the suitability of a location for a particular year, it gave limited information on appropriate conditions in general. The most likely reason for this can be found in the relation between nutrient availability and growth rate. The nutrient availability that results in high growth rates of *S. aloïdes* seems to differ hardly from that which results in negative growth rates.

Solid basis: law and protected status

A.viridis is included in the list of endangered species of the IUCN, in Appendix II of the Bern Convention and particularly in Appendix IV of the EC Habitats Directive. It is present on many national Red Lists, including that of the Nether-

Figure 3. Distribution of A. viridis *in the Netherlands.*

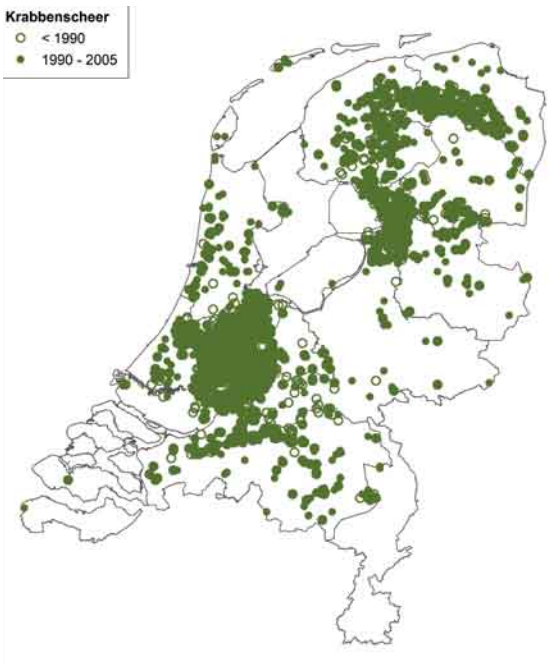

Figure 4. Distribution of S. aloïdes *in the Netherlands.*

Figure 5. Jandirk Kievit with his favourite plant (Photo: H.H. de Vries).

Figure 6. Creation of a new ditch in the Uithoorn Polder (Noord-Holland) (Photo: H.H. de Vries).

lands. Although the species is protected by the EC Habitats Directive, implementing this directive through laws and regulations has not yet been fully realised. This is partly because rules for management of water bodies need to be adjusted. Not only in nature reserves, but also in intensively used agricultural areas, where it occurs in ditches and small canals. In 2006 the Dutch water boards (Unie van Waterschappen, 2006) published a new code for appropriate water management, making protection of *A. viridis* in agricultural areas easier. This code recognises the importance of *S. aloïdes* for the survival of *A. viridis.*

Not so long ago, in many areas farmers were obligated to clear ditches of all vegetation. The presence of vegetation in a ditch led to warnings or fines by the water board. At present, complete removal of vegetation is forbidden without a special permit; at least 50% of the vegetation has to be left in the ditch. Although the code was meant for water boards, it gives guidelines to all owners of sites where *S. aloïdes* and *A. viridis* occur.

Implementation of the Species Protection Plan

The implementation of the national species protection plan for *A. viridis* started in 2002. It was preceded by a protection plan developed by the Province of Utrecht. The Province of Utrecht and the six other dutch provinces in which *A. viridis* occurs play an essential role in the implementation of the protection plan. As a part of the protection plan information about the ecology of *A. viridis* is distributed among them. The aim is to improve national and provincial policies for this species and to enhance national coherence between projects. To make the protection plan work, the provinces are working together. This is all done in close collaboration with Dutch Butterfly Conservation. The first important task was to gather enough information about the condition of local habitats spread out over more than seven provinces. Several provinces started up projects for surveys for acquiring more information on the distribution of *A. viridis*, for the protection of populations and for the creation of new habitats.

One of the first projects was in the province of Noord-Holland in the polder of Uithoorn. New habitats were created by digging new ditches (figure 6). alongside the old ones, experimentally introducing new specimens of *S. aloïdes.* The hydrology of part of the polder was re-designed. A few plants were put into this new ditch and less than two years later the first results were visible (figure 7). Apart from the creation of new ditches, some ditches were enlarged in order to give *S. aloïdes* more space to grow. Furthermore, the course of the water during dry periods was altered in such a way, that the water in the central parts of this polder retained its good quality. Earlier, the level of the water had already been adjusted to a higher level as a conservation measure, but in order to reduce

inflow of water during drier seasons, a more variable water level was acceptable during summer. Also in 2003, several projects were started in the provinces of Zuid-Holland and Utrecht under the supervision of Landschapsbeheer Zuid-Holland in order to create ditch banks that are more natural. A second interprovincial plan for the four Northern provinces, Friesland, Groningen, Drenthe and Overijssel, was carried out in 2006 and 2007. This comprised gathering information on the distribution of *A. viridis* in Fryslân (Friesland) (De Boer, 2006), management of known populations (De Boer, 2006; De Vries & Peet, 2006) and realising new habitats for *A. viridis* (De Vries & Peet, 2006; Vliegenthart & De Vries 2007). Some of these results can be found on the website www.groeneglazenmaker.nl.

Personal involvement, a decisive factor

Many people are active at regional and local level, who have done some very valuable work. The best example comes from the province of Friesland, where a new project started in 2004. For this project about forty volunteers were recruited to help with the protection of *A. viridis* in the province. In the first two years, 2004 and 2005, they obtained detailed information on the occurence and status of *A. viridis* and *S. aloïdes.* This yielded a considerable amount of data which will be used for conservation purposes during the coming years (De Boer, 2006). The most important task of these volunteers in the future will be communicating about necessary management. The success of this project depends on the active involvement of local volunteers, coordinated by a person with good communication skills. Although not every province can rely on so many volunteers, several other initiatives have been realised.

The future of Aeshna viridis

This species protection plan has made many people aware of the importance of this species and its habitat, including nature managers, policy makers and the general public. Protection of this key species of peatland areas also leads

Figure 7. Regeneration of S. aloïdes *after measures were taken in Uithoorn (Photo: H.H. de Vries).*

to protection of its habitat and several other species of flora and fauna. This protection plan has officially come to an end in 2008, but I am convinced that many initiatives for protecting *A. viridis* and its habitat will still be carried out. The situation of *A. viridis* has been improved, not only by this plan, but also by the implementation of the Habitats Directive. Dutch Butterfly Conservation will keep working together with others in order to protect dragonflies; in this work the protection of *A. viridis* will continue to occupy an important position.

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Summary

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Green Hawker *Aeshna viridis* was the first dragonfly in the Netherlands to have its own national species protection plan. This was published in 2001 by the Ministry of Agriculture, Nature and Fisheries, aiming to initiate several conservation activities. As *A. viridis* is strongly associated with *Stratiotes aloïdes,* this plant plays an important role in the strategies adopted for protection and communication. The protection plan led to a number of projects in several provinces, including the compilation of distribution maps, communication about good management and starting nature restoration. Backed up with European legislation, the need for protection of this species has come to the attention of a much wider audience. Therefore, it can be expected that this plan will continue to have an effect long after the projects it gave rise to have ended.

Samenvatting

In Nederland was de Groene glazenmaker (*Aeshna viridis*) de eerste libel met een eigen national soorbeschermingsplan. Dit werd gepubliceerd in 2001 door het ministerie van LNV met als doel een aantal beschermingmaatregelen te initiëren. Omdat de Groene glazenmaker sterk verbonden is aan het voorkomen van Krabbenscheer (*Stratiotes aloïdes*), speelt deze plant een belangrijke rol bij de beschermingsstrategie voor de Groene glazenmaker. Het soortbeschermingsplan heeft geleid tot een groot aantal projecten in verschillende provincies in Nederland, waaronder het maken van verspreidingskaarten, voorlichting over goed beheer en herstelmaatregelen. Gesteund door wetgeving heeft de noodzaak voor bescherming van de soort grote aandacht gekregen bij een breed publiek. Hierdoor mag verwacht worden dat dit plan ook in de toekomst nog een belangrijke rol zal spelen in de bescherming van deze bedreigde soort.

Zusammenfassung

In den Niederlanden *Aeshna viridis* war die erste Libellenart mit einem eigenem nationalem Schutzkonzept. Dieses Schutzkonzept wurde durch das Ministerium für Landwirtschaft, Natur und Fischerei im Jahre 2001 publiziert, mit dem Ziel, verschiedene Schutzaktivitäten zu initiieren. Da *A. viridis* ausschließlich gemeinsam mit der Pflanze *Stratiotes aloïdes* vorkommt, spielt diese eine wichtige Rolle in der Schutz- und Kommunikationsstrategie. Das Schutzkonzept führt zu einer großen Zahl von Projekten in verschiedenen niederländischen Provinzen, zum Beispiel in der Ausarbeitung von Verbreitungskarten, der Kommunikation über gutes Management und den Beginn von Renaturierungsmaßnahmen. Unterstützt durch die Gesetzgebung hat die Notwendigkeit zum Schutz dieser Art große Aufmerksamkeit bei einem weiten Publikum erreicht. Daher kann erwartet werden, dass das Konzept weitergeführt wird, um den Schutz dieser gefährdeten Art voranzubringen, auch nachdem die aufgeführten Projekte realisiert wurden.

Keywords: Odonata, *Aeshna viridis, Stratiotes aloïdes*, species protection plan, nature conservation, the Netherlands