



SWNM Trawling Guide Natura 2000

**An audit on the relative impact of
bottom trawling on Natura 2000 sites in
the North Sea**

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The SWNM – Foundation for a Scientific Nature & Environmental Policy- is a grassroots Dutch NGO supported by fishermen who endorse environmental policies based on verifiable facts and knowledge of fisheries practices. It promotes a view of sustainable use of natural resources based on sound biology. The SWNM advisory board consists of academics with a life-time experience in fisheries biology and research.



The SWNM was founded in 2002 by the Dutch farmer Jan van de Geest. His cows were poisoned by sewage overflow, released from the sewer to surface waters by the Dutch Waterboard in episodes of high rainfall. Van de Geest filed a complaint to the Waterboard, but was ridiculed by government officials and many of his opponents. After all, he was 'only a farmer'. Van de Geest won his court case by issuing independent academic research on water quality, motivated by his dedication to factfinding and truth. After Van de Geest received compensation by the Waterboard, the problems of water pollution by sewage overflow came high on the national agenda.

Website: www.swnm.nl

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1. Why does SWNM publish the Trawlingguide Natura 2000?

Policymakers and NGO's overemphasize negative consequences of bottom trawling on habitat characteristics of Natura 2000 habitat¹ in the North Sea, in the view of fishermen. The Dutch government and its ecological advisory body Alterra/Imares identify the elimination of trawling in large areas as an important way to 'restore' the sandy coastal bed, qualifying its conservation status as 'unfavourable'². Dutch bottom trawlers might lose up to 25 percent of their fishing ground in the North Sea coastal zone and parts of the Dogger Bank, because of ecological effects attributed to bottom trawling by scientists from government advisory body Imares. NGO's in their PR promote the complete elimination of bottom trawling, which would 'damage' the sea floor.³

Many fishermen believe their activities have a lower relative influence compared to other human activities, storms and tidal flow in the North Sea. Their relative influence has also lowered significantly in recent years. The Dutch fishing fleet- mostly bottom trawlers- lost 45 percent of its capacity and 121 vessels were decommissioned in the last 15 years due to government measures. The SWNM tests the 'fishermen'-hypothesis, by comparing the ecological and physical impact of bottom trawling as reported in the scientific literature with other human activities and natural influences.

2. Are bottom trawlers the largest influence on the sediment of the North Sea seafloor?

The Dutch government finances large scale development (6 GW+) of wind farms in habitat H1110 with tripods of 80.000 ton piled into the sea floor⁴. It constructed an island for the extension of the Port of Rotterdam in 2008 (front page photo), changing hydrodynamics along the Dutch coastal zone⁵. Imares- advising government in fisheries closures- is developer of islands for windfarms⁷ and a Balance Island in Natura 2000-area, as a barrier for intrusion of salt water in the Haringvliet. Dutch government also facilitates more gas exploration by the NAM in the Wadden Sea estuary⁸ (H1110a). Exploration for salt has lowered the sea bed and tidal flats with 32 centimetres since 1995⁹. On the Dogger Bank, large areas in Natura 2000 are claimed by Forewind for construction of wind farms piled into the sea bed.

Also the government body responsible for coastal defence, Rijkswaterstaat, triples the volume of large scale supplement of sand in Habitat H1110 in the period 2012-2015¹⁰ for coastal defence, compared to 2000 (5 million metric tons). The 'Delta Commission'- founded to formulate policies to mitigate projected sea level rise- estimates an extra volume of 80 million metric tonnes is needed in 2080. Coastal defence measures have changed sedimentation and flow of sea water since the 'Afsluitdijk' was constructed in 1929 cut of the Zuiderzee, part of the Wadden Sea¹¹. Effects on tide and sediment flow can still be measured. Put in perspective, claims on the long term influence of trawling on the sandy sea bed in the coastal zone should be taken with caution.

¹ H1110 sandbanks slightly covered by sea water all the time. For definition see: Marine Expert Group (2005). New definitions for Habitat 'Sandbanks which are slightly covered by sea water all the time (1110)'. Final Draft, 25 February 2005. Manuscript, 5 pp.

² Natura 2000 profile document (Alterra 2006) pg 18: the 'unfavourable'-status is attributed by Alterra/Imares authors to 'unnatural'... size composition of fish stocks and low abundance of 'characteristic' species. This definition is in contradiction to the Habitat 1110-preferences defined by other nations like Great Britain. Pe Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17 : *Sandbanks which are slightly covered by sea water all the time are features defined by their physiographic nature rather than by a specific biological community.*

³ Greenpeace, WWF and North Sea Foundation pe in press release June 2011: Greenpeace and WWF received 2 million euro's in March 2011 from the Dutch lottery 'PostcodeLoterij' to campaign against fishermen

⁴ One windfarm of Eneco, Q10 in Natura 2000 habitat receives 850 million euros of subsidies, the new government has increased its target of 'renewable energy' (weather dependant energy-generation) to 16 percent and according to government officials this target can only be achieved by large scale development of Offshore Windenergy.

⁵ Ton IJlstra -projectleader on fisheries measures for Natura 2000- was projectleader for Dutch government in developing the 'Tweede Maasvlakte', the extension of the Port of Rotterdam into the North Sea.

⁶ Rijnsdorp, A.D., M. van Stralen, D. Baars, R. van Hal, H. Jansen, M. Leopold, P. Schippers en E. Winter (2006) Rapport inpassing visserij-activiteiten compensatiegebied MV2. IMARES, IJmuiden. As a form of 'nature compensation' for construction of the extension of the Port of Rotterdam 'Maasvlakte 2', the government banished fishing activities in neighbouring areas, claiming on advice of Imares this would be 'equally' ecological beneficial

⁷ 'Imares en Offshore Windenergie' Chris Westra June 2012, for participation in Dutch Government programme TKI Wind at Sea: stimulation of large scale offshore wind farm development. Imares aims for research projects earning 1 to 3 million euro's of government funds with 50 percent financial participation of government. For 'fundamental research' Imares expects 100 percent government subsidies. It aims at ecological impact studies of windfarms, but also experiments for construction of windfarms and an Island with coparticipation of offshore constructor Van Oord.

⁸ <http://www.elsevier.nl/Nederland/nieuws/2013/3/Kabinet-stemt-in-met-extra-gaswinning-in-Waddenzee>

⁹ http://www.geocaching.com/seek/cache_details.aspx?wp=GC18NZJ

¹⁰ Baptist, M. Wiersinga, W. (2012) 'Zand er over, 4 scenario's voor zachte kustverdediging' De Levende Natuur

¹¹ Rakhorst 2003 cited in EVA 2, pg 59: amplitude of tide in the Western Wadden Sea increased from 127 cm to 190 cm



3. What is the geological origin of the sediments in the North Sea bottom?

The Southern North Sea is relatively young and was formed after the last Ice Age, in the current geological period the Holocene when sea levels rose. A mobile top layer of fluvial sand of 10 meters was formed in the Holocene from rivers like the Rhine depositing their sediment in the Delta.¹² Sandbanks formed after sea levels rose and due to tidal currents. The largest part of the southern North Sea has this sandy upper layer mixed with a maximum of 5 percent of clay. It is this upper layer in which penetration of fishing gear takes place to a maximum of about 3 cm, depending on weight of the beam trawl gear and fishing speed. The top layer rests on a layer formed in the Ice ages of the Pleistocene with gravel, peat and Aeolian sands, in times when an arctic dry steppe climate reigned in the region. (Twente formation)

One of the most important fishing grounds, the Doggerbank is a sand bank formed around 8000 yrs ago when the isle of Doggerland was flushed by the rising sea. The Doggerbank is named after a ‘dogger’, the mediaeval name for a Dutch cod fishing vessel. At this moment, partly on initiative of Dutch government measures are taken to close parts of the bank for fishing to ‘protect’ the sea floor and it’s fauna.¹³ Researchers lack data of trends in fauna in relation to fishing pressure, and the Dogger Bank has been trawled intensively since ancient times.¹⁴ Thus ecological effects of the measures against fishermen can never be quantified.

4. Does bottom trawling damage the North Sea sediment?

Impact is a function of the nature of the sediment, and the intensity with which a type of fishing gear is used per area unit. Not the type of fishing gear itself. Long term impact of bottom trawling is high on complex solid substrates like coral and nearly absent on sandy sediments¹⁵. Sandy sediments deliver the highest economic value for bottom trawlers in the North sea, not reefs. In sandy sediments of the Southern North Sea most traces of trawling vanish after 37 hours. As Belgian researchers from the Ilvo noted after an extensive review of the relevant literature on the ecological impact of trawling¹⁶, the beam trawl – loathed by green activists- thus is not necessarily the most damaging fishing method. On a global

¹² pe: Veenstra HJ (1965) Geology of the Dogger Bank, North Sea. Marine Geology 3, 245-262

¹³ <http://www.nsrac.org/wp-content/uploads/2011/03/2011-10-10-11-ExCom-Paper-7-Dogger-Bank-report-FINAL.pdf> The Dutch Fimpas served as model for advice on closures of areas for fishing

¹⁴ pp10: Beyond considering the direct pressure footprint of the gear itself, the extent of fisheries effects at the scale of the Dogger Bank and its implications for ecology are, however, difficult to determine. Although some studies have been carried out in the central-11 southern North Sea (e.g. Lindeboom and de Groot 1998), **information on specific impacts of gears in the Dogger Bank area is scarce. (= non existent)**

¹⁵ Hilborn, R. (2012) ‘Overfishing, what everyone needs to know’, Oxford University Press. Gillet R. (2008) Global study on shrimp fisheries. FOA Fisheries Technical Paper 475

¹⁶ Hans Polet Personal communication

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level, trawling on demersal fish provides 20 percent of all fishing income. According to fisheries biologist Ray Hilborn, until now economic viable alternatives for trawling remain rare.¹⁷

5. Is the North Sea floor sediment stable and untouched by natural fluctuations?

No, the upper layer of the H1110-habitat, the sandy sea floor in Wadden Sea and North Sea is highly dynamic. Research in the German Jadebusen, the Wadden- and North Sea coast demonstrates how tidal currents move sand dunes under water with 12 meter over a period of 3 weeks, while other dunes moved 4 meter in opposite direction.¹⁸ In a storm, sea bed sediment is brought into suspension to a depth of over 30 meters¹⁹. When auditing the effects of exploration of natural gas by the Dutch NAM on the sediment flow of the Wadden Sea, the research institute RIKZ found that natural processes like sedimentation, storms and tidal currents compensate the subsidence of the sea bottom of 6 millimetres per year by a factor 3 to 100²⁰, and over 11 years they found no depressions in the sea bottom coinciding with areas of exploration and subsidence.

Though scientific comparison is absent, it is unlikely that these highly dynamic natural processes only mitigate anthropogenic influences, when the Dutch government earns income from natural gas exploration by the NAM.²¹ But that these strong natural influences do not mitigate influence of bottom trawlers on the sandy seabed. If governments want to 'protect' the sandy sea floor of Habitat H1110 against being 'damaged' by bottom trawling, they thus need establish mobile marine reserves, that track and follow the movement of the sea floor under water. In short, regulations 'protecting' a mobile layer of sub-sea sediment, contain an element of non-scientific absurdity, further discussed in 12.



6. Does trawling damage essential characteristics of Natura 2000 habitat in the North Sea?

The major habitat H1110 for Dutch bottom trawlers is sandbanks which are slightly covered by sea water all the time to a depth of 20 meters. Sandy sediments deliver the highest economic value, not reefs (H1170). According to the international definition it's characteristics are the impact of waves, wind and a

¹⁷ Hilborn, R. (2012) 'Overfishing, what everyone needs to know', Oxford University Press

¹⁸ A. Kubicki and A. Bartholomä (2011) Sediment dynamics in the Jade tidal channel prior to port construction, southeastern North Sea Journal of Coastal Research, Special Issue 64, 2011

¹⁹ M.O. Green, C.E Vincent, I.N. McCave, R.R. Dickson, J.M. Rees, N.D. Pearsons (2010) Storm sediment transport: observations from the British North Sea shelf, Continental Shelf Research

²⁰ H.J. Hoeksema, H.P.J. Mulder, M.C. Rommel, J.G. de Ronde, J. de Vlas (2004) Bodemdalingstudie Waddenzee 2004 Vragen en onzekerheden opnieuw beschouwd Rapport RIKZ/2004.025 page 7

²¹ NAM is part of Royal Dutch Shell and has concessions for most Dutch natural gas exploration. The Dutch State earns 12 billion euro's per year from concessions given to the NAM

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dynamical nature, not biotic factors²². Fishing only affects biotic factors. In the Wadden Sea two areas were closed for trawling to determine effects on the bottom fauna, Schild and Boswad. After 5 years of closures²³ researchers of Imares found no difference in benthic fauna compared to fished areas. Researchers believe even this period is too short to find effects.²⁴ This has been the only research on effects of trawling with a baseline reference after Natura 2000 areas where established in Dutch coastal waters in 2006.

7. Does trawling threaten long term survival of benthic populations in Natura 2000-areas?

Long lived species like *Arctica islandica* favoured by some ecologists²⁵ are not qualifying species for the Natura 2000 habitat H1110, now subject to policy measures to ban trawling. They occur rarely in the Southern North Sea, and only in deeper parts on slopes below 40 meters, which is not the area most picked by beam trawlers. Species like whelk – also a non-qualifying species- are damaged by beam trawlers when trawling the sediment. Great differences occur depending on the weight of the beam trawl used²⁶. In a trace of light beam trawlers with beam of 4 meter- the only method allowed in the Dutch 12 mile-zone since 1989- 95 percent survived trawling. With heavy trawlers with a beam of 12 meter 40 percent survived.

Shallow waters of the North Sea- part of Natura 2000- are the domain of benthos that are adapted to a highly dynamic environment like *Macoma balthica*. Extensive research has shown that their prevalence is more determined by natural factors and fluctuations than by beam trawling²⁷. For *Macoma balthica* no population effects were found, even in times of more intensive beam trawling with a 45 percent heavier fleet, in terms of horse power equipped.²⁸

8. Does bottom trawling threaten long term survival of (demersal) fish populations?

It is found that beam trawlers stimulate feeding conditions of their target species sole and plaice^{29,30}. Thus, trawling also has 'positive' effects, depending on ones viewpoint. Good fishing according to Maximum Sustainable Yield withdraws 40 percent of the biomass of a fish population, stimulating survival of younger fish (which are not longer cannibalized by adults). Intensive fishing influences size at age among fish species³¹, but diversity of species has not declined in the North Sea. Overall size of commercially caught fish has declined in the North Sea, compared to non-target species but there is no 'fixed' or 'natural' state in which size at age among populations should be., and smaller size at age does not necessarily point to lower fitness.^{32,33} Also scientists more and more doubt if size distribution is a reliable parameter for fishing pressure³⁴ and conservation³⁵.

²² Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17, pg 3

²³ Dr. Jaap van der Meer in 'De Levende Natuur', mei 2012, Van der Meer is senior-researcher in the Schild/Boswad-programme

²⁴ Opmerkelijk is dat de zelfde Imares-onderzoekers, waaronder Ingrid Tulp- wel voor 2014 en in 2 jaar tijd conclusies willen trekken over de invloed van garnalenvisserij op het Wad in het kader van VIBEG. Voor dit onderzoek betalen vissers 2 miljoen euro.

²⁵ Lindeboom H. De Groot (1998) Impact 2, research often referred to in claims of 'damage' among 'long lived species'.

²⁶ Mensink, B.P., C.V. Fischer, G.C. Cadée, M. Fonds, C.C. Ten Hallers-Tjabbes & J. P. Boon, 2000. Shell damage and mortality in the common whelk *Buccinum undatum* caused by beam trawl fishery. *Journal of Sea research* 43(1): 53-64.

²⁷ M.J.N. Bergman J.W. van Santbrink J. Buijs J.A. Craeymeersch G.J. Piet A.D. Rijnsdorp C. Laban W. Zevenboom (1998) The distribution of benthic macrofauna in the Dutch sector of the North Sea in relation to the micro distribution of beam trawling BEON Rapport nr. 98-2 BEON project NIOZ 96 V 26 ISSN 0924-6576

²⁸ A. D. Rijnsdorp, A. M. Buys, F. Storbeck, E. G. Visser (1998) Micro-scale distribution of beam trawl effort in the southern North Sea between 1993 and 1996 in relation to the trawling frequency of the sea bed and the impact on benthic organisms *ICES Journal of Marine Science*, 55: 403–419. 1998

²⁹ Rijnsdorp, A.D., Vingerhoed, B., 2001. Feeding of plaice *Pleuronectes platessa* L. and sole *Solea solea* (L.) in relation to the effects of bottom trawling. *J. Sea Res.* 45, 219–229.

³⁰ Ir. Hans Polet pers comm.

³¹ Rice, J. & Gislason H. 1996. Patterns of change in the size spectra of numbers and diversity of the North Sea fish assemblage as reflected in surveys and models. *Ices Journal of Marine Science* 53, 1214-1225

³² Gislason, H. (2001) The effects of fishing on non-target species and ecosystem structure and function, Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem Reykjavik, Iceland, 1-4 October 2001: blz 6-7 <http://ftp.fao.org/fi/document/reykjavik/pdf/15Gislason.pdf>

³³ Katja Enberg, Christian Jørgensen, Erin S. Dunlop, Øystein Varpe, David S. Boukal 1,2,8, Loïc Baulier, Sigrunn Eliassen, Mikko Heino (2012) Fishing-induced evolution of growth: concepts, mechanisms and the empirical evidence *Marine Ecology Volume 33, Issue 1, pages 1–25, March 2012*

³⁴ Hilborn, R., C. Minte-Vera (2008). Fisheries induced changes in growth rates in marine fisheries: are they significant?, *Bulletin of Marine Science* (Vol 83:1- pp95-105)

³⁵ Greenstreet, S. P. R. 2008. Biodiversity of North Sea fish: why do the politicians care but marine scientists appear oblivious to this issue? – *ICES Journal of Marine Science*, 65: 1515–1519

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Fishing pressure in the Southern North Sea has declined by 40 percent since the nineties. Dutch government already banned heavy trawlers (+300 hp) from the 12 mile- zone since 1989, leading to a decline of fishing pressure of 85 percent in the nineties. The reports that government advisory body Imares/Alterra delivered for government, bases it's conclusion of an 'unfavourable' status because of an 'unnatural' size distribution within fish species and 'rarity of typical species'.³⁶ It relies on 25 year old data in it's judgment³⁷, before these large changes in fishing pressure took effect. Dutch government relies solely on Alterra/Imares-authors and their personal views for assessing conservation status³⁸.



9. Is trawling responsible for the demise of eel grass beds?

A popular view of some NGO's³⁹ is that trawlers eliminated eel grass beds (*Zostera marina*), and thus elimination of trawling 'restores' eel grass beds. Evidence points in a different direction. The rapid demise of large beds of eel grass in shallow estuaries occurred across the northern hemisphere after a parasite occurred in the '30s: *Labyrinthula zosterae*. Also the 'Afsluitdijk' that closed off the southern Wadden Sea in 1929 took it's toll,⁴⁰ with heavier currents in the Marsdiep and higher tide differences in the Western Wadden Sea, the area where eel grass beds were most common.

According to reports of the Danish Environment Department it is the dynamic of wind and sea that determines whether eel grass beds occur. In the shelter of some Danish Wadden Sea Islands large eel grass beds remain, while in more dynamic parts among Jutland they are absent.⁴¹ The Wadden Sea Secretariat

³⁶ Natura 2000 profile-document 2006 page 18: the 'typical species'- a Dutch addition to international criteria- are mentioned in and other baseline document preceding the profile document- partly by the same authors: *Spisula sp.*, *Echinocyamus pusillus*, *Asterias rubens*, *Ammodytes spp.*, *Callionymus spp.*, *Pomatoschistus spp.*, *Echiichtys vipera*, *Pleuronectus platessa*, *Limanda limanda*

³⁷ Leopold, M.F. & N.M.J.A. Dankers (1997). *Natuur in zoute wateren. Achtergrondrapport 2c, Natuurverkenningen 97*. It refers to work of Henrik Gislason in the '80s for it's claim of 'unnatural' size distribution

³⁸ The leading author of Imares Natura-2000 reports, Han Lindeboom has been campaigner for Marine Protected Areas for 20 years, also with Greenpeace.

³⁹ Waddenvereniging, the Wadden Foundation in *Visserijnieuws* 15-3-2013; of it's income of 2 million euros it spends 70.000 euro's on science

⁴⁰ dr R.Boddeke, *Jaarrede Ons Belang Harlingen* 28 september

⁴¹ http://www2.dmu.dk/1_viden/2_publicationer/3_fagrappporter/rapporter/fr488_p1-61.pdf

"Natural physical stress factors are also of major importance for the biological content of several of the Annex 1 habitats. Sandbanks along the east coast of Jutland can have well-developed eelgrass beds. *On the sand banks along the exposed west coast of Jutland there are no eelgrass beds*, but instead there are dense populations of bivalves – at least off the Wadden Sea.

points to changes in wave dynamics as a cause in it's 2005 report halting the return of eel grass beds.⁴² In the Northern Wadden Sea large eel grass beds still occur, which makes trawling as a cause unlikely.

10. Can scientists verify if measures against bottom trawlers 'improve' a habitat?

Scientists should be able to define the difference between the relative influence of bottom trawling (see 5)- and 'damage'- a long lasting discernable effect affecting essential characteristics of an ecosystem as defined in the Habitat Directive⁴³, that can be attributed to trawling. The largest global research on the influence of (shrimp) trawling on the seabed did not find an agreed definition of 'damage' to sandy sediments⁴⁴. There is no definition of measurable 'damage' in the highly dynamic Habitat H1110. Research for the European Commission found no clear and universally agreed definition of one Natura 2000/Marine Directive-feature 'integrity of the seafloor'⁴⁵, apart from that restoration of the initial state before trawling should be 'rapid and secure'.

For Dutch Natura 2000 areas in the North Sea there are no data on trends, and thus there is no reference of how a 'favourable' conservation status is reached and can be measured when trawling is banned, nor a reference state⁴⁶. In the Dogger Bank there are no data on benthic population trends in the Dutch part, still benthic populations are mentioned as the main justification for closed areas in the Dogger Bank⁴⁷. Also in the German part of Dogger Bank trend data where lacking. So scientists in the German Empas-project advised to only adopt experimental closures in the Dogger Bank.⁴⁸ This lack of sound data and definitions leaves judgement in distinction between 'influence' and damage to personal views of authors of government advisory bodies⁴⁹, which clears the road to politics dressed as science⁵⁰.

11. Are measures against bottom trawling for Natura 2000 based on science?

The political process⁵¹ precedes the publication of reports on conservation status, with scientists –paid by government- providing data once a policy decision is outlined and needs justification. A major feature of flawed science is that the conclusion changes when the baseline is varied.⁵² In Natura 2000-reports of government advisory bodies, one arbitrary year is picked as a baseline and reference status of the ecosystem, a 'norm' how nature should look like and be directed to, without a measurable goal of what an area should look like, since 'best available data' in many cases means 'no data'. In Dutch Natura 2000 this

Only in the sheltered waters of the Wadden Sea behind the islands of Rømø and Fanø and the Skallingen peninsula is the eelgrass able to get a foothold"

⁴² pg 204 in Essink, K., Dettmann, C., Farke, H., Laursen, K., Lüerßen, G., Marencic, H. and Wiersinga, W. (Eds.), 2005. Wadden Sea Quality Status Report 2004. Wadden Sea Ecosystem No. 19. Trilateral Monitoring and Assessment Group, Common Wadden Sea Secretariat, Wilhelmshaven, Germany.

⁴³ 'Conservation status of a natural habitat, in accordance with the Habitats Directive, is considered as the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species.' There are NO data that reliably relate CURRENT fishing pressure to and trend in any Natura 2000 area

⁴⁴ Gillet R. (2008) Global study on shrimp fisheries. FOA Fisheries Technical Paper 475

⁴⁵ Rice, J. et al (2012) Indicators for Sea-Floor Integrity under the European Marine Strategy Framework Directive, Ecological Indicators Vol 12, issue 1, pp 174-184. restoration should be 'rapid and secure'. The 'integrity of the sea floor' is a criterium from the Marine Strategy Framework Directive in 2008 that leaked into Natura 2000 after establishing the areas in 2004

⁴⁶ Lindeboom H. (2008) 'Ecologische atlas Noordzee ten behoeve van gebiedsbescherming': Wageningen Imares: the atlas maps distribution of all known species prevalent in the North Sea. It states that it cannot be used as reference for policy measures, because sufficient data are lacking.

⁴⁷ FIMPAS3, the Dutch government board decided to ban fishing in the Dogger Bank: "Ban Beam, otter trawls, demersal seines in specific areas; in other areas controlled fishing. The areas will include various benthic communities on the Dogger Bank". Closed areas are added to large areas that fishermen lose to Forewind, the large scale construction of wind farms on the shallow parts of this Natura 2000 site.

⁴⁸ Dr. Heino Fock, pers comm.. 'When I was involved in the EMPAS project, I put forward the proposal of experimental closures, to collect data on what is happening in these areas. I think, this is a strong indicator that scientific background at least at the beginning of the N2000 process when the designations have been submitted was not available to the extent needed'.

⁴⁹ In Holland this personal judgment prevails through most documents of Natura 2000-advice by Imares and Alterra.

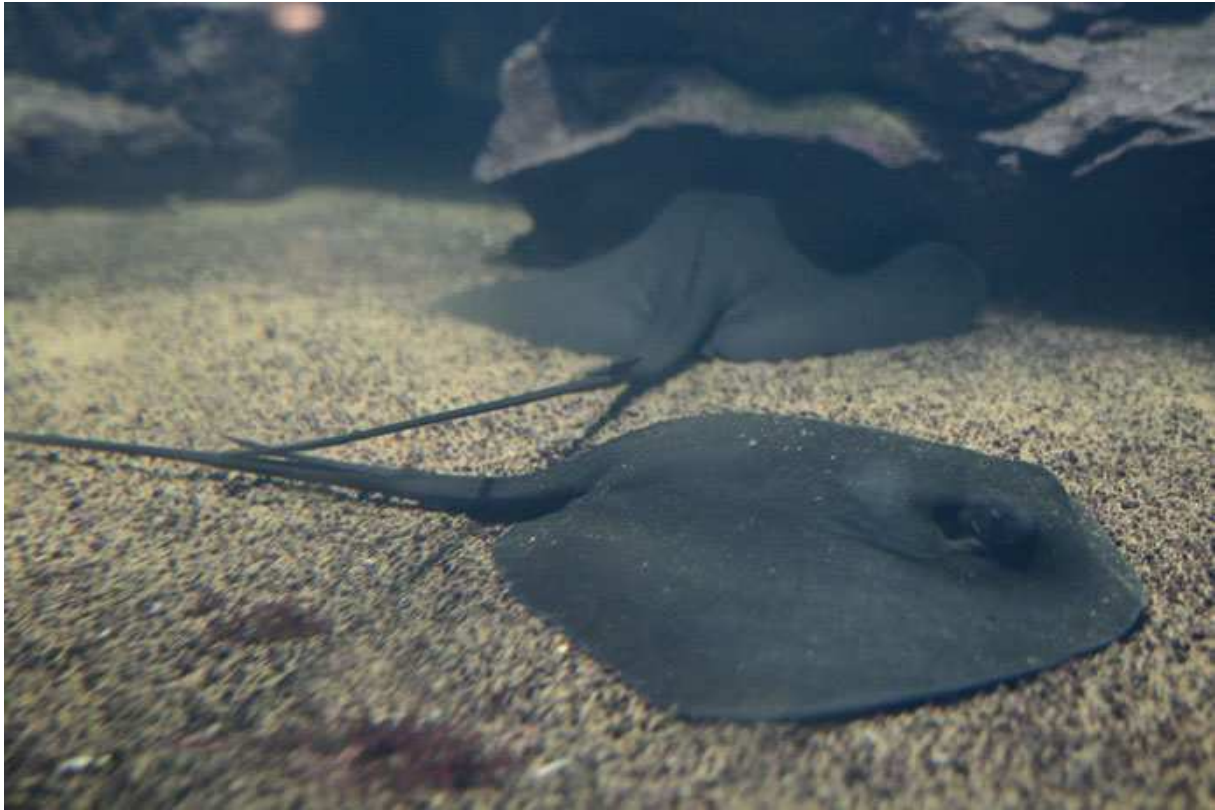
⁵⁰ The lead author of Imares-reports for government advising on Natura 2000 Han Lindeboom, is also campaigner for Greenpeace for Marine Protected Areas with no fishing zones

⁵¹ The North Sea Regional Advisory Council Spatial Planning Working Group Scotland House, Brussels

23rd March 2011: Before any data were present the Dutch Fimpas-project of Dutch government resulted in January 2011 in the decision – partly forced by green activist NGO's like Greenpeace invited as 'stakeholder'- to close parts of the Dogger Bank for beam- and ottertrawlers and regulate other types of fisheries and forced onto the fishing sector: the long held desire to establish 'marine protected areas' translated as closed areas for fishing is derived from the Ospar-convention and the Convention on Biological Diversity, and is originally not related to Natura 2000.

⁵² Wildavsky A. But is it true?, a citizen's guide to environmental health and safety studies, pp 423 Harvard University Press 1995: 'rule 23, vary the baseline and see if the conclusion is robust'.

'normative' year is 1982⁵³, and ecological 'quality' is principally and negatively related to fisheries in Dutch policy documents.⁵⁴



There is a broad and decades long discussion how to distinguish between 'influence' and 'damage' in ecological literature.⁵⁵ 'Disturbance' and change are natural features of all ecosystems⁵⁶, and baselines without human influences are mostly absent for centuries⁵⁷. For example, there is no reference of an 'unfished' Dogger Bank as the area has been fished extensively for centuries. Neither are criteria formulated what the area should look like. Common indicators to measure ecosystem functioning depend on interaction strength among species, more than the number of species prevalent in a habitat: dominant and abundant species have more influence than a maximum number of different species/ 'biodiversity'. Meanwhile 'productivity' is the most used indicator of ecosystem functioning.

12. What ideological view on nature underpins NGO-sentiments against fishermen?

The popular- but unscientific- view of a 'natural balance'⁵⁸ is prevalent in the American Wilderness ideal 'where man is only a visitor'. It is the dominant philosophy of many NGO's campaigning against fishermen in Brussels⁵⁹, heavily funded by American philanthropists. The ideological view of a 'balance of nature' underpins global⁶⁰ and European environmental policies, which assume a 'delicate balance' is

⁵³ Taken literally, with the choice of this baseline 1982 'restoration' would mean adding dissolved phosphorous to enhance eutrophication as European environmental regulations against eutrophication were not yet into effect, and killing the harbour porpoise population that was largely absent in the early eighties

⁵⁴ Integraal Beheerplan Noordzee 2015: this policy document from 2004 attributes a negative undefined 'quality' of the North Sea to fisheries

⁵⁵ Walker, L.R.(2012) *The Biology of Disturbed Habitats*, Oxford University Press.319 pp. Een 'schadelijke'ontwikkeling is meetbaar aan het functioneren van een ecosysteem via het instorten van biomassa en productie via wegvallen van de belangrijkste 'spelers' met de grootste interactiesterkte, of drastisch soortenverlies.

⁵⁶ Picket, S.T.A. White, P.S. (eds) (1985) *The ecology of natural disturbance and patch dynamics*, Academic Press, New York

⁵⁷ K. J. Willis, H. J. B. Birks (2006) *What Is Natural? The Need for a Long-Term Perspective in Biodiversity Conservation Science* Vol. 314 no. 5803 pp. 1261-1265

⁵⁸ Ecologist Steward Pickett suggests the adoption of 'the flux of nature' as a replacement in popular discourse

⁵⁹ Giron, Y (2012) *Blue charity business, reform of the common fisheries policy* http://www.peche-dev.org/IMG/pdf/121107_blue_charity_abstract_en-2.pdf

⁶⁰ <http://www.un.org/ecosocdev/geninfo/sustdev/es&5biod.htm> Earth Summit 5, New York 23-27 june 1997: Special Session of the General Assembly to review and appraise the implementation of Agenda 21 states: *'The loss of biological diversity*

disturbed, and should be restored by regulating, or ‘eliminating’ anthropogenic influences as stated in Oskar in 2010.⁶¹

In the ‘balance of nature’-sentiment, there is no distinction between damage and human influence, nature is ‘good’ and man is ‘bad’/‘unnatural’. So damage by a storm is ‘natural’ = good. ‘Influence’ on the seabed by fishing gear is ‘unnatural’= bad. The sea becomes ‘healthy’⁶² and ‘clean’⁶³, once the cancer of man⁶⁴ is removed. This holistic view on ‘natural health’ and ‘natural purity’ is deeply rooted in the Western cultural heritage, and also widely used in commerce advertising a product is ‘100 percent natural’ (= ‘good’). In ecology this view on nature dates from German zoologist Ernest Haeckel- who coined the term ‘ecology’, nature’s household- but with roots in Greek Philosophy.⁶⁵

13. Can nature be directed into an ‘ideal’ state?

The ‘balance of nature’ – an ideal and steady state that nature reverts to when humans are removed- is a non-scientific myth. In Darwinian perspective and scientific ecology, there is no principal difference between human and natural influences, natural or ‘unnatural’⁶⁶. For over a quarter of a century scientific ecology has adopted a paradigm of non-equilibrium, where change is the norm. Thus the ecosystem as a whole does not reach a ‘balance of nature’⁶⁷ – an optimum state that it reverts to- when human influences like trawling would be eliminated. The ‘balance’-approach also contradicts statements from the Convention on Biological Diversity where ‘humans are an integral part of many ecosystems’.⁶⁸

14. What motivates governments/NGO’s to prioritize ‘bottom contact’ of fishing gear?

Firstly the Oslo Paris Convention adopted on 25 march 1998⁶⁹ that stated to regulate ‘non-polluting’ human activities and 2003 on a network of Marine Protected Areas,⁷⁰ and ‘ecosystem approach’ which is derived from the Convention on Biological Diversity (CBD) of the United Nations⁷¹. Oskar became a vehicle to implement the CBD-regulations in the North Sea after the Inter Ministerial Meeting in Bergen in 1997 ‘to ensure *sustainable (...), sound (...)* and *healthy(...)* ecosystems in the North Sea’, three non-scientific criteria. Current European Natura 2000 policy is thus derived from political ideology⁷² and non-democratic conventions that are implemented into European and national policies.^{73,74}

endangers the delicate balance of nature that supports life on Earth’ Agenda 21, the United Nations Agenda for ‘sustainable development’ implements the Convention on Biological Diversity from which most European nature policy is derived.

⁶¹ The goal of Oskar and it’s Ecoquo-criteria, adopted in the Marine Directive is to ‘eliminate eutrophication’, as evil per sé, it is ‘bad’ because it is anthropogenic and ‘does not belong there’.

⁶² The campaigning goal of the Dutch North Sea Foundation is a ‘healthy’ North Sea. This ‘healthy’sea is also the campaigning goal of the European Commission

⁶³ The campaigning goal of Greenpeace is literally to strive for a ‘clean’ earth.

⁶⁴ Club of Rome 1972, ‘Earth has a cancer, and it is man’.

⁶⁵ It thrived as the Nazi’s leading philosophy striving for racial ‘purity’. It underpinned assumptions of improving the ‘health’ of the ‘German People’ where a ‘people’ was viewed upon as a body, as formulated by physiologist Jacob von Uexkull. But it also has more innocent connotations in commerce, like Heinz Tomato Ketchup advertising it is ‘100 percent natural’.

⁶⁶ Jagers, G (2012) De Soortenstorm, Het nut van biodiversiteit in evolutionair perspectief KNNV 120 pp

⁶⁷ Kricher.J. 2009 ‘The Balance of Nature’: Ecology’s Enduring Myth: Princeton University Press

⁶⁸ <http://www.cbd.int/decision/cop/default.shtml?id=7148> COP5, V6, “An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. **It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems.**

⁶⁹ Convention on the Protection of the Marine Environment of the North-Eastern Atlantic, Paris, 22 September 1992, resulting from the Convention on Biological Diversity in Rio de Janeiro in June 1992, adopted in 25 March 1998 translated as marine protected areas

⁷⁰ OSPAR Recommendation 2003/3 on a Network of Marine Protected Areas.

⁷¹ Fifth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, 15 - 26 May 2000 - Nairobi, Kenya COP 5 Decision V/6

⁷² <http://www.cbd.int/convention/articles/default.shtml?a=cbd-00> The preamble to Convention on Biodiversity 1992 claims preserving biodiversity will bring peace to earth, and claims an ‘intrinsic value’ of biodiversity, a holistic/ non-darwinian view on nature. The precautionary principle is leading in European environmental policies and the Convention on Biological Diversity in 1992. See for a critique Scruton, S. (2012) Green Philosophy, how to think seriously about the planet: chapter 4, the precautionary principle and it’s ‘chosen level of protection’ legitimizes regulation of any perceived risk by a legislator, regardless of evidence.

⁷³ Agenda 21, UNCED, stipulates the “action plan” for the 21st century, which is designed to meet the CBD’s objectives. Chapter 17 of that document considers marine ecosystems and the need to mitigate the *detrimental* impacts of fishing activities on them. The Convention on Biological Diversity (UNEP Rio 1992) is also the source of the ‘ecosystem approach’, now adopted in the Marine Directive of the European Commission. At the Bergen Inter Ministerial Meeting 1997, ministers recognized OSPAR (the combined Oslo/Paris Commissions) as the authority competent to identify issues that an ecosystem approach to management would need to address

⁷⁴ The European Benthic programme run by Imares started in 2012 to provide policymakers a justification for the ecosystem approach on benthic organisms that should be adopted through the EU in 2020 for the Marine Directive. Empirical justification

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In his lecture 'Nature policy, challenges in a changing world' EU- Environmental commissioner Stavros Dimas assured his audience on 14 february 2008 that existing use of natural resources like hunting and fishing could continue in Natura 2000, saying the contrary view was a widely held misconception.⁷⁵ This claim is only related to the initial aim of Natura 2000. After Natura 2000 areas were established in 2006, Natura 2000 became a carrier to implement additional regulations⁷⁶, from Oskar and CBD. Additionally the European Commission added fisheries measures in 2008, thereby using Natura 2000 as an additive means to regulate fishing activities for it's Common Fisheries Policy.⁷⁷ Current approach to MPA's as 'closed areas' is different from the definition given by CBD, assuming MPA's only have 'higher level of protection'.⁷⁸



for the extension of bureaucracy is the major source of income of Imares and advisory bodies with governments as their main customer.

⁷⁵ http://europa.eu/rapid/press-release_SPEECH-08-82_en.htm Dimas: '... I would like to correct one of the common misconceptions about NATURA 2000 – which is that once a site is designated all economic activities have to stop. **This is simply not true** and it is unfortunate that this myth continues. The NATURA network consists of living landscapes in which farming, fishing, forestry and hunting can continue.

⁷⁶ Fock, H. (2011) Natura 2000 and the Common fisheries policy Marine Policy 35 (2011) 181–188: **Natura 2000 had no immediate effect on fisheries management because the initial effect on several Member States was to see their obligations restricted to territorial waters (i.e., areas 12 nautical miles from the baselines, where the CFP applies only under certain conditions).**

In May 2007, the European Commission (EC) published guidelines for establishing Natura 2000 sites in the marine environment, followed in 2008 by guidelines for fisheries measures in Natura 2000 sites, thereby establishing a first link between fisheries policy and Natura 2000. Additionally, the 2007 EC guidelines clearly referenced the Oslo-Paris Commission (OSPAR) goal of establishing a network of MPAs.

⁷⁷ The North Sea Regional Advisory Council Spatial Planning Working Group Scotland House, Brussels 23rd March 2011: Pg 7 In negotiations with fishermen objecting to additional measures on the Dogger Bank, John Clorley of DEFRA neglects fishermen's proposals stating the discussion on Natura 2000 areas is now over. Thus fishermen have reached a 'Catch 22' in negotiations. They did not object to the *establishment* of Natura 2000-areas in 2006, while they could agree with the initial 'sustainable use'-approach of Natura 2000. This approach changed by adding Marine Protected Areas from Oskar narrowed down to closed areas. In discussing closures in the Dogger Bank, fishermen are now told to accept closures because they did not object to Natura 2000 area-establishment.

⁷⁸ COP 7/ Decision 7/5 2004 The Ad Hoc Technical Expert Group adopted the following definition of "marine and coastal protected area", which incorporates all of the IUCN categories of protected areas: "Marine and coastal protected area" means any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna and historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than it's surroundings.