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Identities, Communities, and Practices in the Transition Towards Sustainable Mussel Fishery in the Dutch Wadden Sea

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23 **Identities, Communities, and Practices in the Transition towards** 24 **Sustainable Mussel Fishery in the Dutch Wadden Sea**

25

26 **Abstract:** The Dutch mussel fishery is currently involved in a transition towards sustainable
27 practices in the Wadden Sea, a World Natural Heritage Site. During the transition period the
28 traditional but controversial method of dredging mussel seed from natural beds using trawl
29 nets will be replaced, step-by-step, by alternative methods. The main objective of the
30 transition is to allow the natural development of mussel beds ecosystems, and to
31 simultaneously achieve large scale sustainable mussel fishery. The transition is a joint
32 enterprise of state officials, environmental organizations, and the mussel sector, and requires
33 striking a balance between the different interests and identities. As such, it may be considered
34 as an example of social learning. This article explores the multiple efforts and controversies
35 that populate the transition towards a sustainable Dutch mussel culture by making use of
36 concepts such as, identities, communities and practices. What is innovative in the character of
37 this transition endeavor, the article concludes, is that new practices have brought together two
38 in principle contradictory identities in order to negotiate natural and social limits that might
39 facilitate a sustainable future in the Wadden Sea.

40

41 **Keywords:** Nature conservation, identity, transition, communities of practice, mussel fishery,
42 Wadden Sea.

43

44

45 **Introduction**

46

47 One of the most serious environmental problems is the decline or collapse of fish stocks and
48 the subsequent socio-economic impacts on people dependent on these (Kooiman et al. 2005).
49 The great challenge is to develop sustainable fishery systems that address both the needs of
50 fishery communities and environmental requirements. This article explores the transition
51 efforts of the mussel fishery in the Dutch Wadden Sea, a shallow sea at the rim of the
52 European continent (Fig. 1) consisting of tidal flats, salt marshes, and barrier islands, which is
53 generally recognized as a wetland of international importance.

54 In the Wadden Sea, the blue mussel (*Mytilus edulis*) – henceforth simply referred to as
55 the mussel – is one of the keystone species. Mussels live in colonies forming solid structures
56 called mussel beds. These mussel beds increase the diversity of habitats, and thereby the
57 biodiversity of the Wadden Sea (Albrecht 1998; Van der Heide et al. 2012). Mussel beds, for
58 example, provide habitats for organisms such as the shore crab (*Carcinus maenas*), the winkle
59 (*Littorina littorea*), and the sand worm (*Nereis virens*) (Dankers and Zuidema 1995). In

60 addition, mussels are an important source of food for birds such as the oystercatcher
61 (*Haematopus ostralegus*), the red knot (*Calidris canutus*), and the eider duck (*Somateria*
62 *mollissima*). The environmental and ecological value of the Wadden Sea is recognized, for
63 instance, by UNESCO, which has placed this area on the World Natural Heritage Sites list;
64 moreover, it is protected as a part of the European Natura 2000 network of nature reserves.¹
65 However, the Wadden Sea is also recognized for its economic value. In addition to fisheries,
66 other economic activities in this area are gas exploitation, salt mining, port related industry,
67 and recreation.

68 The interaction of environmental and economic interests usually generates prolonged
69 conflicts, with often disappointing results for many parties. Such conflicts have taken place in
70 the Wadden Sea area, involving all the major economic activities: shellfish fishery (e.g.,
71 Swart and Van Andel 2008; Hanssen et al. 2009), gas exploitation (e.g., Turnhout et al. 2008),
72 salt mining, industries, and recreation (Wortelboer and Bischof 2012). In order to articulate
73 the controversy that has emerged around conflicting interests between the commercial
74 production of mussels and the nature conservation of mussel-beds-related ecosystems, the
75 government, the mussel fishery sector, and environmental organizations are currently
76 involved in a joint enterprise to realize a transition towards a sustainable mussel fishery. The
77 transition especially concerns the method used for harvesting mussel seed – that is, the small
78 mussels that form the basic resource for mussel farming. During the transition period the
79 traditional but controversial method of dredging mussel seed from natural beds using trawl
80 nets will be replaced, step-by-step, by alternative methods. The main objective of the
81 transition is to allow the undisturbed development of mussel beds in the Wadden Sea, and to
82 simultaneously achieve sustainable mussel fishery.

83 These firm limits to human use of the Wadden Sea in terms of conservation and
84 restoration ends are required by the European Natura 2000 framework and, within the Dutch
85 context, this has been framed (Meijer et al. 2004; RVDW 2007) within the concept of *natural*
86 *limits*. According to Swart and Van der Windt (2012:402) this concept implies: “a framework
87 of limit values for the most important natural parameters on which there is scientific
88 consensus, such that if these limits are not exceeded, natural processes will continue
89 undisturbed.” The application of this natural limits concept to the Wadden Sea has been
90 justified in policy advices (Meijer et al. 2004; RVDW 2007) because the area is legally
91 considered to be one of the most important Dutch natural areas. However, Swart and Van der

¹ A large part of the Wadden Sea is regulated by Natura 2000, which is based on the European Bird and Habitat directives.

92 Windt (2012:404-405) have stressed that, to understand conflicts around setting conservation
93 goals, what they call *social limits* must also be taken into account, more or less analogically
94 defined as: “a framework of limit values for the most important societal parameters on which
95 there is social and scientific consensus, such that if these limits are not exceeded essential
96 societal processes or conditions will go on undisturbed.” When natural and social limits do
97 not overlap, this may provide space for resource utilization, otherwise at least one of the
98 limits must be dropped.

99 The transition of Dutch mussel fishery may be considered an attempt to establish both
100 the natural and social limits for mussel fishery. In so doing, the parties involved have
101 therefore signed a “transition covenant.” The natural limits are delineated by, among other
102 issues, the transition covenant’s recognition that the main objective for the Wadden Sea is
103 ensuring its “sustainable protection and development as a natural area and the preservation of
104 the unique open landscape” (PNERW 2010:68 – translated from the Dutch). Accordingly, the
105 parties recognize the shared interest of lowering the dependency of the mussel sector on
106 bottom-seed fishery and creating trajectory for natural recovery. However, that the economic
107 perspective (i.e., social limits) of the mussel fishery in the Wadden Sea will be maintained is
108 also explicitly stated: fishing activities in the Wadden Sea, for instance, have to be guaranteed
109 for the long term. Ever since the covenant was signed, the mussel fishery sector, individual
110 fishers, a number of environmental protection organizations, and the government have been
111 involved in planning and carrying out practical experiments in order to develop a sustainable
112 practice for mussel fishery. These efforts are focused on completely ending bottom-dredging
113 of natural beds in 2020. The transition may be considered as a social learning² endeavor, since
114 it is characterized by the transition’s theme of “learning by doing.” As steps are taken in the
115 execution of the transition’s plan, knowledge is produced through constant monitoring, while
116 learning moments are generated that might lead to a sustainable transition (PNERW 2012).
117 We may thus consider the transition enterprise of the mussel fishery as an example of social
118 learning that seeks to establish, through the delineation of natural and social limits, a
119 sustainable practice for mussel fishery.

120

121 Theoretical background

122

² Muro and Jeffrey (2012) defined social learning as “a process of collective and communicative learning that is thought to enable stakeholders to arrive at a shared understanding of a specific environmental situation, and to develop new solutions as well as ways of acting together in pursuit of a shared ambition.”

123 The transition effort fits the growing body of literature that focuses on system transitions
124 towards sustainable development (e.g., Grin et al. 2010). This is a co-evolutionary perspective
125 that shows how the different elements of a system (e.g., visions, user practices, regulatory
126 frameworks) interact and can be rearranged to trigger social change (Schot and Geels 2008;
127 Seyfang and Haxeltine 2012). Three key elements that have to be considered when exploring
128 transitions towards sustainability are: (1) “Managing central expectations.” Expectations are
129 essential because they guide transitions. In this article, we explore the underlying identities
130 that shape the expectations of the different stakeholders involved in the mussel transition. (2)
131 “Building social networks.” This is important for facilitating the interaction between actors.
132 Here, we focus on the degree of community participation within the social network organized
133 around the mussel transition. (3) “Learning practices” is the third element. In this article we
134 address the relationship between the conducted practices and the defined objectives towards
135 sustainability.

136 Moreover, the developments found in the mussel transition fit also the current trend in
137 environmental governance aimed at boosting social learning through integrative and
138 participatory knowledge management strategies (Armitage et al. 2008; Turnhout et al. 2008;
139 Raymond et al. 2010). A related model introduced by Wenger and colleagues (2002) in order
140 to understand the role of social learning is the theory of *communities of practice* (CoP). CoPs
141 are “groups of people who share a concern, a set of problems, or a passion about a topic, and
142 who deepen their knowledge and expertise in this area by interacting on an ongoing basis”
143 (Wenger et al. 2002:4).

144 According to Wenger and colleagues (2002), there are three central elements that
145 facilitate the understanding of learning processes – namely: the domain, the community, and
146 the practice. These elements reflect the central aspects of the transition theory above
147 described. The first element, the *domain* of knowledge, relates to the identity of the
148 community, which is defined by a shared area of interest (e.g., issues, problems). In the
149 mussel transition, we may assume that its *identity* can be expressed in terms of the
150 *expectations* of stakeholders to define the transition’s objectives towards a sustainable mussel
151 fishery. That is, a fishery that takes into account both the economic perspectives of the mussel
152 fishery sector and the natural recovery of wild mussel beds. These objectives have been, in
153 principle, accepted by all covenant signatories. The second element, the *community*, involves
154 the people engaged in joint activities, discussions, and information exchange (Wenger 2006).
155 Here we might cite representatives from the government, the mussel sector, and the
156 environmental organizations involved. The third element, the *practice*, implies a “shared

157 repertoire of experiences, stories, tools, and ways of assessing recurring problems” (Wenger
158 2006:2). Here we can cite meetings, the reports produced by the members of the community,
159 and practical experiments to replace bottom-dredging by alternative methods, or the closure
160 of areas to fishery.

161 Moreover, an important underlying concept (also for the CoP theory) is the concept of
162 *boundary objects*, introduced by Star and Griesemer (1989:393), meaning “objects which are
163 both plastic enough to adapt to local needs and the constraints of the several parties
164 employing them, yet robust enough to maintain a common identity across sites.” Wenger and
165 colleagues (2002) apply such boundary objects as a linguistic form of collaboration for
166 connecting and freeing-up different parties or practices. Such objects can be concepts, things,
167 maps, and even landscapes. For example, the Wadden Sea area itself can be seen as a
168 boundary object because it connects people, while, at the same time, the meaning of the area
169 can be interpreted quite differently by different parties. For example, it is considered by
170 environmentalists as a natural ecosystem that should be protected and restored as much as
171 possible, while fishers primarily view it as their traditional fishing ground. We see in the
172 transition, however, that both parties agree that the Wadden Sea is an area that should be
173 managed in a sustainable way.

174 In our approach we aim to apply these terms and concepts in order to characterize and
175 understand the dynamics of the mussel transition as an example of a social learning practice
176 towards a more sustainable development. The three main questions we aim to answer are:

- 177 1. How can the domain of the mussel transition be characterized, taking into account the
178 different identities with different transition objectives?
- 179 2. How can the community of the mussel transition be characterized in terms of the
180 degree of community participation of the different stakeholders?
- 181 3. To what extent do the practices (e.g., experiments and interactions) of the community
182 strengthen the sustainability objectives as defined in the transition’s covenant?

183 Data for this exploration have been collected through research using scientific literature,
184 reports, policy documents, newspapers articles, and websites, and by semi-structured
185 interviews with key actors from government, fishery organizations, fishers, and
186 environmental organizations.³ In the next section, we describe the current status of the

³ Data was collected between the spring of 2012 and the fall of 2013. Ten semi-structured interviews were conducted in the months of May and June 2012. The interviews were conducted and literally transcribed in the Dutch language. Moreover, the transcripts were analyzed according to the three research question (see here above, main text). Specific quotes for this article have been translated by our research team and English proofread by the Language Center of the University of Groningen.

187 transition. Afterwards, we will analyze the transition process according to (and answering
188 therefore) the three research questions formulated. In the last section of this article we will
189 derive some tentative conclusions.

190

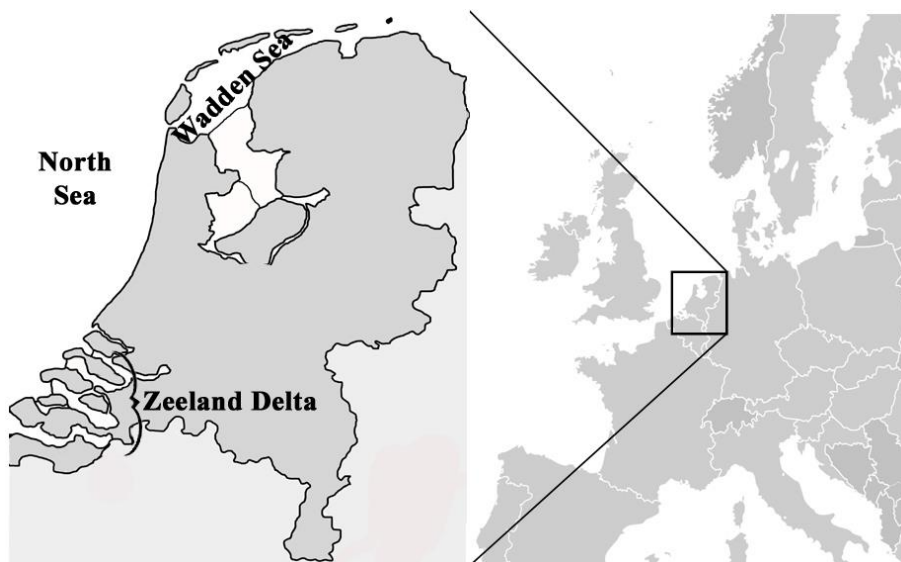
191

192 **Dutch mussel fishery: A practice in transition**

193

194 Mussel cultivation started in the Zeeland Delta in the south-west of the Netherlands (Fig. 1) in
195 the 19th century (Ens et al. 2004). In the Wadden Sea, this practice was introduced in the
196 early 1950s after a parasite decimated the Zeeland Delta mussel population (Smaal 1991; Ens
197 et al. 2004). Currently, some 80 companies cultivate mussels in the western Dutch Wadden
198 Sea on subtidal flats leased from the government. In 2011, a total of 7707 hectares were
199 distributed among 510 plots in this area (De Mesel et al. 2011). The sector estimates that
200 about 700 persons are currently directly employed in the mussel culture.⁴ In 2009,
201 approximately 170 of them were working in the mussel fleet (Taal et al. 2010).

202



203

204 **Fig. 1** Map of the Dutch coastal zone.

205

206 Mussel cultivation depends on access to “mussel seed,” that is, one-year-old mussels
207 measuring 10-30 mm (Spencer 2002). The traditional method is to dredge mussel seed, with
208 trawl nets from natural beds, and subsequently to deposit this on cultivation plots with a lower
209 density than natural beds in order “to improve growth and fattening” (Spencer 2002:150).

⁴ www.vriendenvandemossel.nl (accessed March 2014).

210 Most seed for Dutch mussel cultivation is harvested in the Wadden Sea because the Zeeland
211 Delta shows far less spat fall⁵ (Bult et al. 2003).

212 During the first year, mussels on cultivation plots reach up to 40-50 mm. Frequently
213 these mussels are moved to other plots “with good growing conditions and low storm risks”
214 (Dankers and Zuidema 1995:73). During the second year they grow to a commercial size of
215 55-70 mm (Spencer 2002). Mussels are then harvested and transported to auction. Empty
216 plots are subsequently cleaned, and new half-grown mussels are deposited.

217 De Mesel and colleagues (2011) found that in the fall of 2010 a total of 47.5 million
218 kilograms of mussels were present in the western part of the Dutch Wadden Sea. Although
219 production fluctuates yearly, these figures make the Netherlands one of the main producers in
220 the world (Spencer 2002).

221 In the early 1990s, the combined effect of storms, bad spat fall, and intensive shellfish
222 fishery led to the disappearance of many intertidal mussel beds (Dankers and Zuidema 1995;
223 Ens et al. 2004). This resulted in high mortality rates among birds, for which these bivalves
224 are staple food (Beukema 1993; Turnhout et al. 2008). This event triggered a major
225 controversy between shellfish fishers and environmental organizations about the future of the
226 cockle and mussel fishery. Aiming to find a balance between these two groups the Sea and
227 Coastal Fisheries Policy came into effect in 1993. Among other measures, areas were closed
228 for shellfish harvesting with the primary goal of restoring mussel beds. In addition, a policy
229 for bird food preservation was implemented, enabling complete closure of areas in years with
230 low shellfish stocks (MANFQ 1998; Hanssen et al. 2009). The effects of this policy were
231 assessed in 1998 by an ecological evaluation program (EVA-I). However, the policy
232 amendments failed to end the conflict because the measures apparently did not convince all
233 stakeholders (Hanssen et al. 2009). Moreover, the controversy had already become a public
234 debate in the media (Swart and Van Andel 2008). In this context, a follow up evaluation,
235 EVA-II, was conducted, led by a steering committee formed by governmental officials,
236 fishery representatives, environmental organizations, and research institutes. Despite these
237 cooperative efforts, Hanssen and colleagues (2009) argued that “stakeholders remained
238 entrenched in their respective positions,” the pro-nature camp arguing that fishery had been
239 “proven to be damaging,” while the pro-fishers side claimed the opposite – defending its
240 position in court and disregarding research results. In November 2004, however, the
241 government approved a plan to end mechanized cockle fishing from January 2005 onwards,

⁵ Spat fall is the process in which bivalves larvae (e.g., mussels) attach to a surface and begin to develop shells.

242 buying out this industry with money obtained from lifting the moratorium on gas exploitation
243 in the Wadden Sea (Meijer et al. 2004). Moreover, mussel fishery was required to work
244 towards being sustainable by 2020. Nevertheless, fishing permits were repeatedly granted by
245 the Dutch authorities, which allowed seed-dredging activities to continue. Some
246 environmental organizations thought that these mussel-seed fishing permits did not
247 acknowledge the natural limits for the use of the Wadden Sea and fought them in court.
248 Subsequently, in 2008, the Dutch State Council ruled that permits for this kind of fishing in a
249 large part of the Wadden Sea were illegal, relying on EU Habitat and Bird directives.
250 According to the council, scientific evidence that mussel fishery did not significantly harm
251 natural mussel beds was lacking (Hanssen et al. 2009; Jansen et al. 2012).

252 In reaction, mussel fishers launched the campaign “Stop the Green Lie,” strongly
253 criticizing the environmental movement for disturbing productive processes in (culturally and
254 economically) relevant Dutch agrarian and fishery sectors. In particular, they criticized the
255 environmental organizations that fought the permits in court.⁶

256 The social and political pressure was such that both parties began intensive
257 negotiations, and finally an agreement was reached in 2008 (between the government, the
258 environmental organizations, and the mussel fishery sector) in the form of a covenant aiming
259 to gradually replace the unsustainable bottom-trawling with non-bottom dredging methods.

260

261 The transition

262

263 At present, two partly overlapping phases can be distinguished in the transition after signing
264 the covenant. During the first phase from 2008-2010, the agreement was further elaborated in
265 the form of the execution plan published in the spring of 2010 (PNERW 2010). The second
266 phase concerns the implementation of the transition plan. This plan already began in 2009,
267 when the mussel sector voluntarily decided to reduce bottom-dredging by 20%, as a first step
268 in the transition, and without any assurance of an alternative (PNERW 2012).

269 The execution plan stipulates stopping, step by step, the bottom-trawling of mussel
270 seed in natural mussel beds, replacing it with alternative methods. On the basis of historical
271 analyses, it was estimated that an average total amount of 40 million kilograms of seed could
272 be caught in the Wadden Sea annually. Accordingly, it was agreed to irreversibly close down
273 natural mussel beds trawl fishery in seven steps by 2020. Each step would have to be taken if

⁶ www.stopdegroeneleugen.nl/index.php?option=com_content&view=article&id=48&Itemid=53 (accessed March 2013).

274 the annual production of mussel seed by alternative methods was to be increased by about 5.5
275 million kilograms (PNERW 2012). The agreements and the results of the transition made are
276 regularly monitored and reported on in the form of progress evaluations.

277 During the first phase, the transition project consisted of two groups made up of
278 members from all the covenant partners involved: a steering group making the decisions and a
279 project group that prepared the decision-making process around the technical aspects of the
280 transition (see next section). This steering strategy has been continued in the second phase of
281 the current transition process.

282 From these ongoing experiments, it appears that the so-called “mussel seed or spat-
283 collectors” are rather effective as an alternative for bottom-dredging. Usually these are net- or
284 rope-like structures suspended in the water column, attached to a number of floats or to long-
285 tubes (Fig. 2) that are anchored to the seafloor. Mussel larvae, which are free-living
286 organisms up until a size of approximately 0.3 mm, settle on the spat-collectors (Jansen et al.
287 2012). When they are grown to the appropriate size, they are harvested from the collectors
288 and dropped on the cultivation plots.

289



290

291 **Fig. 2.** Spat-collectors in the Wadden Sea (adapted with permission; left-picture's source:
292 www.wageningenur.nl/nl/Dossiers/dossier/mzi.htm; right-picture's source: www.mzi.nu. Accessed March
293 2014).

294

295 The transition has led to mixed results so far. The years 2010 and 2011 showed very low spat
296 fall. In 2011 the total production by spat-collectors was 7.4 million kilograms. However, part
297 of the total production came from collectors installed before the covenant agreement and
298 another part was collected from collectors in the Zeeland Delta. These two portions do not
299 count in terms of the transition (PNERW 2012; Jansen et al. 2012), and the amount of mussel
300 seed that counts in the transition step was lower than the required 5.5 million kilograms. Thus,
301 after the aforementioned initial closure of 2009, the reduction of bottom-trawling stagnated.
302 However, 2012 delivered a good spat fall, and spat-collector production has also been good

303 (11.5 million kilograms in the Wadden Sea),⁷ meaning that the second step of the transition
304 was already completed in 2013.

305 Moreover, although spat-collectors did not produce enough in order to take the follow-
306 up transition steps in the first years, collector technology is considered as having been rather
307 successful because, despite low spat fall, it has resulted in higher seed harvests for those
308 fishers using the method. On the other hand, the collectors require heavy financial
309 investments on the part of mussel fishers, jeopardizing (if the collectors do not pay off) the
310 continuation of the transition.

311 So far, it is difficult to establish whether the other transition objective, that is, mussel-
312 bed restoration, has been successful. Star-fish (*Asterias rubens*) predated most of the mussel
313 population in one (approximately 150 ha) of the two already closed mussel-bed areas (Jansen
314 et al. 2012).

315 In 2012 the transition discussion focused on another issue. According to Dutch law it
316 is forbidden, without permission, to transport mussel seed harvested in the Zeeland Delta to
317 the Wadden Sea (where growing conditions for mussels are better) because of the threat of
318 introducing exotic species, that can harm the protected Wadden Sea ecosystems.
319 Nevertheless, the covenant framework has arranged some protocols for these south-north seed
320 transports. Because of the low seed harvest of 2010 and 2011, the Ministry allowed south-
321 north transports in April 2012. Around 40 transports were carried out, from parcels in the
322 Zeeland Delta to the Wadden Sea. To prevent the introduction of exotic species, several
323 measures were taken. Samples were collected in the Zeeland Delta to detect undesirable
324 species. Transports were carried out in the early spring, when water temperature is low, thus
325 lowering the probability of undesirable species being present. Finally, mussel seeds were
326 washed with fresh water and samples were taken before they were sown in the Wadden Sea
327 plots.⁸ Environmental organizations, nevertheless, complained about the transports. However,
328 the government did not find their arguments strong enough to reject the transport, because
329 fishers supplied the required scientific assessment in line with the Natura 2000 framework.

330

331

332 **Exploring the mussel transition: identities, communities, and practices**

333

⁷ www.visserijnieuws.nl/nieuws/8185-veel-meer-mosselzaad-ingevangen-in-mzisvoorlopige-oogstgegevens-2012.html (accessed July 2013).

⁸ www.rijkewaddenzee.nl/nieuws/nieuws/toestemming-vervoer-zeeuws-mosselzaad-naar-de-waddenzee (accessed July 2013).

334 The domain: A dialogue between identities

335

336 Within the transition towards sustainability, one of the major challenges is to achieve a
337 common commitment of all parties concerned to meet the different expectations. According
338 to Wenger and colleagues (2002:27), the requirement of a domain of a community of practice
339 is that it “creates common ground and a sense of common identity.”

340 Identity is a widely used concept in sociological literature. For example, Castells
341 (1997-2004:6) defined identity as “the process of construction of meaning on the basis of”
342 cultural attributes “that are given priority over other sources of meaning.” According to him
343 an individual or collective actor may have multiple identities, which often leads to “stress and
344 contradiction in both self-representation and social action” (Castells 1997-2004:6). The latter
345 may well have occurred in the transition, where we can distinguish two types of identities
346 constructing the meaning of the Wadden Sea: one related to *fishing traditions* and an identity
347 related to *nature conservation*. The challenge presented was to link these two identities to the
348 transition objectives: an undisturbed development of natural mussel beds, involving natural
349 limits, and a profitable mussel fishery sector, involving social limits. If these limits do not
350 contradict each other, the interests and expectations of both parties can be achieved;
351 otherwise, a conflict may be expected with respect to these interests and underlying identities.

352 Both identities are deeply rooted in Dutch culture. Large-scale fishery, including the
353 mussel fishing culture, has a long history and may be considered part of the Dutch identity of
354 living with and managing the sea. The Dutch mussel sector literally claims that mussel culture
355 constructs the Dutch identity.⁹ For example, “Mussel-Day” in Yerseke annually draws
356 thousands. Moreover, the mussel fishery is a well-organized sector and even has an NGO-like
357 support group (Friends of the Mussel).¹⁰

358 On the other hand, Dutch nature conservation goes back to the nineteenth century, and
359 millions of people are members of a conservation organization.¹¹ The environmental sector is
360 well organized and includes a cluster of eight different organizations focusing on the Wadden

⁹ www.vriendenvandemossel.nl (accessed July 2013).

¹⁰ This organization claims to count around 5,500 friends (e-mail communication, September 2012).

¹¹ For instance, the Dutch branch of Bird Life International had a total of 153,022 members in 2011 (source: www.jaarverslagvogelbescherming.nl/files/Strategisch_meerjarenplan_2011.pdf, accessed December 2012); Society for Preservation of Nature Monuments in the Netherlands around 730,000

(<http://www.natuurmonumenten.nl>, accessed July 2013); At the end of 2012, the Wadden Association had approx. 43,300 members

(www.waddenvereniging.nl/wv/images/PDF/vereniging/2013/ALVGoedgekeurd_jaarverslag2012.pdf (accessed July 2013).

361 Sea: the Natural Wadden Coalition.¹² In addition, in recent decades the Wadden Sea has been
362 increasingly recognized and evaluated by biologists and environmentalists as one of the main
363 nature conservation areas, and even qualified as the Dutch “last wilderness,” implying that
364 there is no or only limited room for mussel cultivation there. One interviewee (personal
365 communication, June 2012) argued that “the current innovation of spat-collectors is a nice
366 step; but is this really achievable for the mussel sector? But, it goes without saying that there
367 is no space in the Wadden Sea for the mussel fishery as it was before.”

368 These two identities are elaborated upon here as Weberian ideal types for analytical
369 purposes, since we can find some further gradations and nuances of these identities in the
370 Wadden Sea. In the Wadden Sea, for example, there is a long tradition of coexistence between
371 natural and social limits negotiated and shaped by the different actors with different identities.
372 A case in point is the widely accepted existence of parcels for the production of adult mussels
373 where bottom-trawling is tolerated. Moreover, most environmental organizations think that
374 mussel culture belongs to (the identity of) the Wadden Sea. As one representative of an
375 environmental organization said (personal communication, June 2012): “[F]ishery enables the
376 economic sustainability of this area. I cannot imagine the coastline without fishing activities.
377 However, you cannot maintain a system (i.e., fishery) which is unsustainable because of the
378 methods you are using.” This view was supported by a researcher (personal communication,
379 May 2012) involved in the transition: “More moderate environmental organizations also think
380 that fishery is part of the Wadden Sea system, although it ought to be sustainable.” The
381 transition demonstrates the dynamic nature of such socio-natural limits when trying to
382 establish new fishery methods that meet the recognized natural values of the Wadden Sea.

383 Among fishers we also find recognition of the conservation value of the Wadden Sea.
384 For instance, there are fishery organizations, such as the Good Fishers¹³ and the Integrated
385 Fishery Foundation,¹⁴ that claim to practice sustainable fishing methods. Moreover, some
386 mussel fishers agree that the transition to a sustainable practice for collecting seed is desirable
387 and probably unstoppable, since it is part of the current mussel-fishery modernization process
388 (personal communication, May 2012). So both identities have some flexibility, and different
389 groups and individuals have expressed only slightly different interpretations of the socio-
390 natural limits, which might have made it easier to reach some common ground for starting
391 negotiations.

¹² “Coalitie Wadden Natuurlijk.”

¹³ “Goede Vissers” – www.Goedevissers.nl.

¹⁴ “Stichting Geïntegreerde Visserij” – www.geintereerdevisserij.nl.

392 Nevertheless, within the transition endeavor, we see a continuous struggle to shape
393 and reshape such limits by the identities, as illustrated by the conflict of the south-north
394 transport of mussel seed described earlier. Fishers were prepared to risk introducing exotic
395 species to the Wadden Sea, since they believe that the current protocols are appropriate for
396 dealing with these possible risks. For example, a fishers' representative argued (personal
397 communication, May 2012): "Statistically speaking, I know that it is not safe to drive, yet I
398 still prefer to. This is something psychological – the important question is: what risks do you
399 want to take with these issues (i.e., south-north transports) in nature?" A fisherman argued
400 that: "I see this south-north transport as a future central activity for the sector, as something
401 really good [...]; however, we have done it [referring to the protocols] now in a very strict
402 way." However, environmental organizations define a much stronger natural limit as argued
403 by an environmental organization spokesperson (personal communication, June 2012) whose
404 understanding of the Wadden Sea (identity) does not allow for any risk: "These protocols
405 (i.e., to discover unwanted exotic species) help us (i.e., environmental organizations)
406 although, such an assessment is never 100 per cent safe [...] I just do not want to have it on
407 my conscience that the ecosystems were destroyed because we introduced something." On the
408 other hand, some risks have been accepted anyway, as is illustrated by the tolerated 2012
409 transports. They were tolerated (by all parties) because the actual control system was
410 considered, to a certain extent, to be adequate for the control of exotic species.

411 Although the two dominant identities did not merge, they were involved in an
412 innovative process that enabled talks and negotiations. The process can be defined as
413 innovative when we consider it within the context of the longstanding controversies around
414 shellfish fishery. As argued by an environmental organization representative (personal
415 communication, June 2012): "Everybody discussing around one table; that was not done
416 before... (as an environmental organization) you do not speak with fishers." This innovative
417 and constructive character is also acknowledged by representatives from the mussel fishery
418 (personal communication, May 2012): "You come to the negotiation table and then you have
419 to play a role where you don't shout at or confront the others, but work in a kind of think-tank
420 in which constructively and together, you exchange ideas working towards a win-win
421 situation." Or as another fisherman (personal communication, May 2012) said: "It is also a
422 process of getting used to one another; I have been collaborating there (i.e., the transition
423 meetings) with people who, before, metaphorically speaking, I could have drunk their blood.
424 [...] The atmosphere has improved. Because when you are in the trenches, everything the
425 other party does is wrong. But when you say: we have a common problem, then you must

426 make some concessions. We have made a lot of concessions, but the environmental
427 organizations have too. They also have their grassroots, so they encounter the same
428 difficulties that we do.”

429 To conclude, these examples illustrate that, to facilitate a sustainable transition, the
430 debate has to be shaped not only by the figures related to mussel beds, spat-collector
431 productivity, etc., but also by the extent to which different identities shape and re-shape
432 natural and social limits in the Wadden Sea. Wenger and colleagues (2002:153) argued that
433 “there is increasing need to cross boundaries because today’s complex problems frequently
434 require solutions that are not confined to one practice, or even to a single organization” – or
435 confined to a single identity, for that matter. They claimed that many forms of connection can
436 enhance boundary activities. Among them, are “boundary objects that can accommodate
437 similar interpretations across practices (e.g., a well-written contract or design proposal)”
438 (Wenger et al. 2002:154). In this sense, one can argue that the transition’s covenant works as
439 a boundary object, since it is aimed at accommodating and negotiating interests, expectations,
440 and identities across the practice with a sustainable mussel fishery as goal.

441

442 Degrees of community participation

443

444 There are many parties involved in the transition. Not all parties, however, participate in the
445 same way. Based on empirical research, Wenger and colleagues (2002) distinguished three
446 levels of community participation. First there is the “small *core* group of people who actively
447 participate in discussions,” debates, and forums by taking on community projects and
448 identifying topics for the community to address; they move the community along its learning
449 agenda (Wenger et al. 2002:56). Within this core group we usually find the community
450 coordinator who organizes encounters and facilitates connectivity among community
451 members. The next outer level is the *active* group, whose members regularly attend meetings
452 and participate occasionally in community forums, although with lower regularity or intensity
453 than the core group. Beyond these active and core groups, Wenger and colleagues (2002:56)
454 argued that the majority of community members are *peripheral*. They rarely participate but
455 rather observe the interaction between the core and active members. Wenger and colleagues
456 argued that they do not participate because they either think that they lack authoritative views
457 or they just do not have the time to assume more authority. Moreover, they (2002:56) argued
458 that these peripheral activities are important because they serve to further discuss and,
459 therefore, shape the domain. Finally, the argument goes, the outer circle of the community

460 consists of people (outsiders) who are not members of the community “but who have an
461 interest in the community,” for example, customers, suppliers, and “intellectual neighbors”
462 (Wenger et al. 2002:56).

463 In the mussel transition endeavor, we can also distinguish core, active, peripheral, and
464 outsider members. Both the transition’s *core* and *active* community members are mainly
465 formed by the covenant signatories. That is, the government represented by the ministry of
466 economic affairs, four environmental organizations (i.e., the Netherlands Society for the
467 Protection of Birds¹⁵ – Bird Life International partner; the Wadden Association¹⁶; the
468 Foundation Wad¹⁷; and the Society for Preservation of Nature Monuments in the
469 Netherlands¹⁸), and mussel fishers (represented by the Producer Organization of the Dutch
470 Mussel Culture).

471 The transition also has a coordinator who manages the process, for instance, by
472 organizing meetings. The steering committee forms the core group. This committee consists
473 of the chairpersons and representatives of the covenant signatories. It makes final decisions
474 once they are elaborated by the project group. This project group can be considered as the
475 active group in which representatives of the three signing parties are represented. The project
476 group raises and deliberates over issues concerning the transition, eventually assigns scientific
477 research, and prepares policy steps.

478 Beyond these active groups there are the *peripheral* actors, who do not participate in
479 the negotiations yet are affected by the decisions. In this group we have, for instance, the
480 grassroots of both the mussel producer organization and of the environmental organizations.
481 They are actually on the sidelines in that they observe the interaction of their representatives.
482 In this context, the issue of heterogeneity, representation, and legitimacy emerges concerning
483 the extent to which these grassroots, which are the backbones of the two identities (i.e., nature
484 conservation and fishers tradition) described above, accept the decisions and concessions
485 made by their representatives during the transition negotiations. This issue is illustrated by a
486 representative of an environmental organization (personal communication, June 2012): “You
487 slowly try to take with you your grassroots, especially to inform them about why we
488 participate [in the transition], but this is very difficult. People just think that the Wadden Sea
489 is a natural area [...], why should it be emptied by the fishery?” Similarly as articulated by
490 state officials: “This is the dilemma of environmental organizations. On the one hand they do

¹⁵ www.vogelbescherming.nl.

¹⁶ www.waddenvereniging.nl.

¹⁷ “Stichting WAD.”

¹⁸ www.natuurmonumenten.nl.

491 want to take new steps in the transition [...], but, on the other hand, they have to allow fishery
492 in areas in which there were no fishery activities before” (personal communication, June
493 2012). On their end, the representatives of mussel fishers also experience some trouble in
494 convincing their grassroots. A representative of the sector (personal communication, May
495 2012) argued that: “Our grassroots are different from those of the environmental
496 organizations; ours are formed by entrepreneurs and families.” Within this group, we find
497 entrepreneurs who have invested in spat-collectors and move the transition forward. However,
498 others have been unable to make the required investments, – but their interests are,
499 nevertheless, also represented by the producer organization. This is a source of possible
500 conflict within the different groups and, probably, also for the transition. One fisherman
501 argued (personal communication, May 2012): “You can say that the covenant is nice, and that
502 you want to stick to the agreements. But I just want a profitable company. However, now I
503 have to pay for 400 or 500 extra hours a year with less turnover, even losses” (he refers to the
504 time and monetary investments that the spat-collectors require).

505 Finally, beyond these active and peripheral groups, we find the outsiders who do not
506 have a direct stake in the transition but who may be affected by, and may affect the evolution
507 of the transition. Among these outsiders we find, for instance, supermarket retailers. Because
508 of the evolution of markets in which transnational companies have been empowered in a
509 globalized economy, this type of actor is becoming more powerful in the mussel fishery.

510 Furthermore, one might argue that some consultancy bureaus (e.g., MarinX) and
511 research institutes (e.g., Imares-WUR¹⁹) could also be seen as outsiders, since they are not
512 integrated within the transition as partners but work on a contract basis to conduct research on
513 certain topics for the active groups. Finally, other outsider groups are, for example, shrimp
514 fishers and recreational organizations, because they may be affected by transition effects. For
515 instance, the spat-collector installations also hinder fish and sailing activities, and closed areas
516 are not only closed for the mussel fishery but also for other fishing and recreational
517 activities.²⁰

518 The structure provided by the theory of communities of practice has enabled our
519 analysis of transition effort. In the mussel transition we have seen a similar structure
520 characterized by different degrees of community participation as described by Wenger and

¹⁹ www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/imares.htm.

²⁰ See also the news release (in Dutch) and protest of the Association of Sailors in the Wadden Sea (2009) about the procedures for where the locations of spat-collectors in the area should be located: www.wadvaarders.nl/site/pages/verantwoord/dossiers/dossier-mzi-s/wadvaarders-fel-tegen-de-huidige-plaatsing-van-mzi92s-8-mei-2008.php (accessed July 2013).

521 colleagues (2002). Nevertheless, there are differences especially regarding the functions and
522 roles of the core and active groups. The core group in the transition (i.e., the steering
523 committee) mainly has a decision-making role, whereas the active group (i.e., the project
524 group) deliberates, and assigns research projects, and prepares policy steps. Thus, the active
525 group in the transition performs tasks that, according to Wenger and colleagues (2002),
526 should be implemented by the core group.

527 To conclude, a key issue that emerges together with community participation is this
528 one of *power*. For example, environmental organizations have been empowered by their
529 juridical initiatives and the subsequent decision of the Dutch State Council (relying on EU
530 Habitat and Bird directives) regarding fishing permits (see above). On the other hand, we
531 have seen that the mussel sector is very well organized and capable to organize effective
532 public campaigns or assigning research. The longstanding controversies between the two
533 identities and these empowerment processes have forced the covenant partners to collaborate.
534 This has generated a kind of balance of power between the partners. Usually, this relationship
535 is described by arguing that the partners hold each other in a headlock.

536

537 Towards sustainable practices

538

539 Wenger and colleagues (2002) defined the third constituent element of CoP, the practice, in
540 the sense of common resources that “include a variety of knowledge types: cases and stories,
541 theories, rules, frameworks, models, principles, tools, experts, articles, lessons learned, best
542 practices, and heuristics” (Wenger et al. 2002:38). These resources enable the community to
543 address problems or initiate action. The practices of the mussel transition effort also work in
544 the same way: They are aimed at addressing, for instance, the problems generated by
545 traditional bottom-trawling, or those emerging from the upscaling of spat-collectors in the
546 Wadden Sea.

547 According to Wenger and colleagues (2002) one of the tasks of a shared practice is to
548 establish a baseline of common knowledge that can be assumed by the community members.
549 Similarly, transition practices also focus on certain issues and are aimed at generating a
550 knowledge baseline that can be assumed by the different identities involved in the transition.
551 The central transition practices are, for example, upscaling spat-collectors, downscaling
552 seabed-fishery, restoration of mussel beds by closing areas to fishery activities, and designing
553 of a protocol to manage the south-north transport risk. These practices are defined in the
554 covenant’s implementation plan (PNERW 2010).

555 One central practice of the transition is, for instance, the deployment in the Wadden
556 Sea of spat-collectors as an alternative method to collecting mussel seed through bottom-
557 dredging. Around this practice, a knowledge base has been generated from the various
558 perspectives. For example, spat-collectors have become an alternative for the controversial
559 traditional bottom-trawling method, and have proven their capacity to collect mussel seed in
560 years with low spat fall (see above). This has, to a certain extent, provided a return on the
561 investments made by those fishers who are experimenting with them. A mussel fisher
562 acknowledges (personal communication, May, 2012) that “it is true that because in the last
563 years there has been low spat fall, those of us who began with the spat-collectors are in a
564 better economic position than those who didn’t.” Nevertheless, he also argued: “However, in
565 years with good spat fall the traditional bottom-trawling method is more efficient. Among
566 other things because the collectors are labor-intensive, and you also have to invest in things
567 like winter storage space.” Another fisher also claimed that high investments are required for
568 appropriate use of the spat-collector technology: “The expenses are huge. We still don’t know
569 how long these materials will last. Then you need winter storage, so we buy it, mortgage, [...]
570 that was not necessary before, but that mortgage, that costs money every month. [...] It is
571 amazing how many extra expenses this stuff requires” (personal communication, May 2012).

572 Beyond the cost-efficiency issues of spat-collectors, such as their return on investment
573 and ability to deliver enough seed for mussel cultivation, there are other environmentally
574 related issues which have been raised by the interviewed representatives of the transition and
575 which are also defined in the reports emerging from the transition practice (PNERW 2012).
576 For example, the effects of spat-collectors on the ecosystem capacities, as the multiplication
577 of spat-collectors may end up having consequences, for instance, in terms of plankton levels;
578 the possible effects (e.g., sound disturbance) of installation, maintenance, harvest, and
579 disassembly on birds and marine mammals; the production of waste matter by the
580 installations – micro-waste, such as plastic due to the regular collector usage, and macro-
581 waste, such as debris due to storm damage, accidents, etc.; and the possible impact on the
582 seascape if numbers increase.

583 Finally, looking beyond fishery practices, we have to remember that another central
584 transition practice is the environmental restoration of naturally evolving mussel beds. With
585 this aim in mind, experiments and monitoring activities have been initiated which also require
586 the attention of the community. One of the most important measures is the closing of areas
587 from fishing activities in an attempt to restore mussel beds. Up until now, however, these
588 measures have been unsuccessful, since no mussel bank has yet evolved. According to a

589 representative of the environmental organizations: “Yes, we have closed areas for fishery
590 where there are no mussels at all; you could ask, does this make sense? On the other hand, we
591 have a kind of mussel rights on paper. So, actually, it is something like virtual mussel banks”
592 (personal communication, June 2012).

593 The practices initiated by the transition are indeed aimed at forming a knowledge base
594 from which to operate in this nature area (i.e., Wadden Sea). To do this, they need to be
595 articulated flexibly enough to match the natural and social limits as defined by the different
596 (inside and outside the transition) identities that form the transition community and shape the
597 Wadden Sea.

598
599

600 **Discussion and conclusion**

601

602 This article has explored the transition efforts of a platform of multi-stakeholders to trigger
603 sustainable practices in the Dutch Wadden Sea. The transition objective is twofold: First, it
604 aims to enable the continuation of large-scale but adapted mussel fishery and, second, to
605 restore natural mussel-bed-related ecosystems. This is not an easy endeavor as there are
606 different interests and identities defining what sustainability is. As such, the transition can be
607 seen as an example of social learning practice in which, by taking some action (e.g.,
608 installation of spat-collectors, closure of areas for fishery), stakeholders aim to learn where to
609 delineate, to a certain extent, the flexible natural and social limits in which to operate.

610 The exploration has, moreover, been conducted by applying central elements and
611 concepts of transition theory (e.g., Schot and Geels 2008) and the theory of communities of
612 practice (Wenger et al. 2002). First, we have the domain; here we see that to address relevant
613 issues and problems and to delineate acceptable natural and social limits of the mussel fishery
614 in the Wadden Sea, the covenant works as a boundary object bringing together the different
615 identities. Second, we have explored the community involved in the transition, presenting the
616 core, the active, the peripheral, and the outsider levels of community participation. This level-
617 approach has been helpful in exploring the role and the degree of involvement of different
618 actors in the transition. For example, it allows us to distinguish those actors who are not
619 directly involved in the transition (i.e., outsiders in CoP terminology) but are affected by its
620 practices, such as shrimp fishery and recreational sailing. Therefore, the active community
621 might also need to learn from and negotiate with these outsiders in order to reach

622 sustainability. Third, the practices carried out by the transition partners can be seen as
623 activities oriented towards generating a knowledge base, from which to engage social learning
624 and sustainable action in the Wadden Sea.

625 Nevertheless, although the CoP theory has been helpful in exploring the transition, we
626 cannot define the transition's community as a community of practice as defined by Wenger
627 and colleagues (2002) because, for example, the community of a real CoP is characterized by
628 the voluntary participation of its members for knowledge sharing and learning purposes;
629 whereas in the transition, and due to the longstanding controversies, the covenant partners
630 have been, to a certain extent, forced to participate. This might reinforce some of the concerns
631 expressed in the literature regarding the lack of attention to power-related issues in CoP
632 theory (see, e.g., Fox 200, Roberts 2006). Moreover, the analytical capacities of the CoP
633 model are limited to exploring the transition context because of the two identities defined
634 above. These two identities make it difficult to speak about a homogeneous community.
635 Rather, we see two visions of the Wadden Sea and of the mussel fishery, with the related
636 parties, due to the persistent controversies, obliged to cooperate within the transition
637 framework according to the covenant. This heterogeneity issue in the transition has been
638 highlighted here and it is also considered by the transition literature. The success of the
639 transition process might depend on the capacity of the core and active groups in maintaining
640 both identities united in making decisions that are widely supported and meet the different
641 expectations, such as, upscaling spat-collectors and strengthening the protocols for south-
642 north transport based on credible and sound knowledge.

643 Moreover, we see that an innovative aspect of the governance approach of the
644 transition effort is the facilitation of a somewhat horizontal platform for decision-making,
645 which is aimed at searching and articulating sustainable alternatives for the controversies
646 around the mussel fishery in the Wadden Sea.²¹ It is innovative because it has facilitated the
647 negotiation between two identities claiming different understandings of the Wadden Sea: on
648 the one hand, as a "field" to collect mussel seed, as expressed by the identity associated with
649 fishing traditions, and, on the other, as a place for the undisturbed development of nature
650 (e.g., of naturally occurring mussel beds) claimed by the nature conservation identity.

²¹ To put the innovative character (beyond the controversies around the shellfish fishery in the Wadden Sea) in perspective, the transition effort has to be understood in the context of the so-called 'Dutch polder model.' It is a decision-making model which is characterized by forms of consultation conducted by state officials to understand the plurality of interests that exist in the Dutch society. One could argue that this cultural conditions form a fertile soil in which the mussel transition can evolve.

651 Some authors in the field of coastal zone management and fishery claim that rather
652 than searching for consensus and one-size-fits-all types of solutions, participatory processes,
653 in which different stakes and worldviews are integrated into a process (in our case, the
654 transition process), can (ought to) be oriented, for example, towards facilitation or conflict
655 articulation rather than towards seeking consensus (McCreary 2001; Van de Hove 2006;
656 Turnhout et al. 2008). Notwithstanding the aforementioned grassroots-representation issue,
657 these transition practices, due to their innovative and constructive character, ought to be
658 further articulated. These practices have been able to bring into the decision-making process
659 two, in principle, contradictory identities in order to negotiate natural and social limits that
660 might facilitate a sustainable future in the Wadden Sea.

661

662

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669

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