

# Favourable Conservation Status for Species: Examining the Habitats Directive's Key Concept through a Case Study of the Swedish Wolf

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## ABSTRACT

One of the key issues in the current controversy over the hunting of wolves in Sweden is whether the wolf population has reached favourable conservation status (FCS). FCS is a legal concept, created and defined in law, but like many legal concepts within environmental law, can only be understood by reference to ecological concepts such as species viability. These ecological determinations in turn often require some sort of legal or policy judgment, such as how great an extinction risk is acceptable for a viable population. This article interrogates contested legal and ecological aspects of FCS and argues for how they might be applied to the Swedish wolf in potential litigation.

**KEYWORDS:** Habitats Directive, favourable conservation status, wolf, recovery, Sweden, EU law, FCS

Central to the European Union (EU)'s strategy for the conservation and recovery of species and habitats is the concept of favourable conservation status (FCS). This idea is the core concept of the Habitats Directive, which directs Member States to take measures to reach or maintain the FCS of natural habitats and species of wild plants and animals.<sup>1</sup> FCS is a legal concept, created and defined by law, but, like many legal concepts, is intelligible only through reference to ecological concepts such as species viability.<sup>2</sup> Proper implementation of the Habitats Directive clearly necessitates thorough knowledge of these underlying ecological concepts.<sup>3</sup> The distinction between legal, ecological and political concepts is not always clear, however, as scientific determinations often involve elements of policy or law.<sup>4</sup> While application

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- 1 Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora [1992] OJ L206/7 (hereafter Habitats Directive).
- 2 Another such concept is the Water Framework Directive's 'good ecological status', recently examined in Henrik Josefsson, 'Ecological Status as a Legal Construct—Determining Its Legal and Ecological Meaning' (2015) 27 JEL 231.
- 3 Gerald Louette and others, 'Implementing the Habitats Directive: How Science Can Support Decision Making' (2015) 23 J Nat Conserv 27.
- 4 See Elizabeth Fisher, *Risk Regulation and Administrative Constitutionalism* (Hart Publishing 2007), for an examination of these blurred lines and the role of law as mediator in matters pertaining to risk.

of the Habitats Directive requires the determination and use of scientific facts, this in turn requires value judgments. If these values go unexamined, we risk that important policy decisions will reflect scientists' own implicit values rather than those expressed by the legal framework. Exposing the role values have in creating facts allows us to argue more cogently for what limits or guidance the law imposes. This article examines the facts, law and values of favourable conservation status against the backdrop of the current legal controversies over wolf conservation in Sweden. In doing so, it highlights the complexity of interpreting a natural science-inflected legal concept within EU law, as well as some challenges in integrating soft law and ecological knowledge into legal analysis.

The Habitats Directive defines FCS for both natural habitats and species. Although these definitions are intertwined, the scope of this article is limited to FCS for species.<sup>5</sup> FCS for species is so defined:

The conservation status of a species means the sum of the influences acting on the species concerned that may affect the long term distribution and abundance of its populations within [the Member States' European territory];  
The *conservation status* will be taken as 'favourable' when:  
-population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and  
-the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and  
-there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis[.]<sup>6</sup>

The European Commission succinctly encapsulates the concept of FCS as a situation in which a species is prospering in terms of both quality and quantity, and is likely to continue to do so in the future.<sup>7</sup> Although Commission guidance is non-binding, this is a good common-sense definition of FCS that encompasses its diagnostic, prognostic and precautionary aspects. However, several elements of FCS remain unclear, such as what constitutes a population, when a species should be considered to be maintaining itself or to be a viable component of its natural habitat, how long constitutes a long-term basis, to what extent historical population levels and carrying capacity play a role in designating conservation status and at what scale or level FCS is to be achieved. Whether or not a species is considered to have reached FCS can have stark implications for how the species is managed. Although the Court of Justice of the EU (CJEU) has decided several cases concerning Member States' responsibilities in managing species that have not reached FCS, it

5 The definition of FCS for natural habitats requires that 'the conservation status of its typical species is favourable. . .'. Habitats Directive (n 1), art 1(e).

6 Habitats Directive (n 1), art 1(i).

7 Commission, 'Note to the Habitats Committee' (DocHab-04-03/03\_rev.3) 4; Commission, 'Guidance Document on the Strict Protection of Animal Species of Community Interest under the Habitats Directive 92/43/EEC' (2007) 9 <[http://ec.europa.eu/environment/nature/conservation/species/guidance/pdf/guidance\\_en.pdf](http://ec.europa.eu/environment/nature/conservation/species/guidance/pdf/guidance_en.pdf)> accessed 26 January 2016.

has not addressed what FCS for species is. In C-342/05 *Commission v Finland* (the Finnish Wolf case),<sup>8</sup> the European Commission brought an enforcement action against Finland for allowing the hunting of wolves to prevent damage to livestock, despite the fact that the wolf had not reached FCS in Finland. While Finland initially contested the Commission's claim that wolves did not have FCS, it eventually conceded that they did not, and the Court did not reason further. In the more recent C-383/09 *Commission v France* (the Alsace Hamster case),<sup>9</sup> the health of hamster populations was again so dire that the Court did not see a need to examine the contours of what would constitute favourability, though it did state some of the factual indicators that the hamsters' status was not favourable. As understanding the concept of FCS is essential to correctly implementing the Habitats Directive, it is very likely that the Court will eventually have to define it in more detail.

For example, whether wolves have reached FCS is a key issue in the current dispute in Sweden over its hunting policies.<sup>10</sup> The Directive does not indicate that quota hunting may be allowed if FCS is reached, but Sweden has interpreted it to do so. There are currently about 460 wolves belonging to the 'Scandinavian population' in Sweden and Norway, with the large majority primarily located in Sweden.<sup>11</sup> These wolves are descended from only five ancestors, which migrated from Finland since 1983 and suffer from inbreeding depression.<sup>12</sup> While wolves are strictly protected under the Habitats Directive throughout Sweden, in practice wolves are not allowed to establish themselves in northern Sweden due to conflicts with the reindeer herding practiced by the indigenous Sami people in north.<sup>13</sup> The result is that nearly all of Sweden's wolves are concentrated in agriculturally developed central Sweden, and have extremely limited connectivity with the neighbouring Finnish/Karelian population. In recent years, Sweden has repeatedly authorised the quota hunting of wolves in central Sweden over the objections of the European Commission, which initiated an infringement proceeding against it in 2011.<sup>14</sup> In its reasoned opinion, the

8 [2007] ECR I-4713.

9 [2011] ECR I-4869.

10 Commission, Additional Reasoned Opinion in Infringement Proceeding 2010/4200 (Swedish) 19 June 2015, 10–12 (hereafter Additional Reasoned Opinion) <[http://jandarp.se/upload/EU-kommissionen\\_Motiverat\\_Yttrande\\_150619.pdf](http://jandarp.se/upload/EU-kommissionen_Motiverat_Yttrande_150619.pdf)> accessed 26 January 2016; Sweden's Reply to the Additional Reasoned Opinion in Infringement Proceeding 20/4200 (Swedish) 19 August 2015, 3 <<http://www.regeringen.se/contentassets/c65fc6f7584a43029746af65b92045ea/svar-kompl-my-2010-4200-varg.pdf>> accessed 26 January 2015.

11 Linn Stenson and others (eds), 'Inventering av Varg Vintern 2014-2015 [Inventory of Wolves 2014-2015]' (2015) 8 <<http://www.slu.se/Documents/externwebben/centrumbildningar-projekt/Viltskadecenter-dokument/VSC-publikationer/VSC%20Rapporter/VSC%20Rapporter%202015/Inventering-av-varg-i-Skand-201415-svensknorsk-15juni-webb.pdf>> accessed 26 January 2016.

12 Olof Liberg and others, 'Severe Inbreeding Depression in a Wild Wolf (*Canis Lupus*) Population' (2005) 1 *Biol Lett* 17; Carles Vilá and others, 'Rescue of a Severely Bottlenecked Wolf (*Canis Lupus*) Population by a Single Immigrant' (2003) 270 *Proc R Soc B* 91.

13 Swedish Environmental Protection Agency, 'Protective Hunting of Wolves: Overview of Regulations and Their Application' (Skydds jakt Varg: Översyn av Regler och Tillämpning) (Swedish) (2015) 49 <<http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/skydds jakt-varg/redovisning-skydds jakt-varg.pdf>> accessed 26 January 2016.

14 Jan Darpö and Yaffa Epstein, 'Under Fire from All Directions: Swedish Wolf Management Hunting Scrutinized by Brussels and at Home', in Charles-Hubert Born and others (eds), *The Habitats Directive in its EU Environmental Law Context: European Nature's Best Hope?* (Routledge 2015) 335–37.

Commission claimed that Sweden's quota hunts did not meet the Directive's standards for strict protection when a species' conservation status is not favourable. The Swedish Government initially agreed that wolves had not reached FCS, but asserted that its hunting policies were nevertheless compatible with the Directive. Additional challenges were brought by environmental NGOs in the Swedish administrative courts, which agreed that the authorised hunting bag limits were unacceptable for a species that had not reached FCS and quashed the decisions to allow quota hunting.<sup>15</sup> Subsequently, in 2013, the Swedish Government claimed that wolves had reached FCS, based largely on population viability analysis that did not take genetic factors into account.<sup>16</sup> In a second reasoned opinion issued in June 2015, the European Commission disagreed, citing scientific reports claiming that the number of wolves was still too low, the genetic health of the population too poor and the connectivity with neighbouring populations insufficient.<sup>17</sup> In its response of August 2015, Sweden defended its policies, but promised a re-evaluation of what would constitute FCS for wolves. The new analysis, reported in October of 2015 by the Swedish Environmental Protection Agency (SEPA), considered genetic factors but again declared wolves to be at FCS despite continuing problems with their genetic health and connectivity.<sup>18</sup> The largest quota hunt to date was authorised for early 2016.<sup>19</sup> Unless significant changes are made, Swedish wolf policies seem likely to reach the CJEU in the near future, either through an enforcement action by the Commission, or through a request for a preliminary ruling by the Swedish

- 15 Stockholm Administrative Court of Appeal, decision 2013-02-06 in Case 746-13 and judgment 2014-11-14 in Case 3273-13; Yaffa Epstein and Jan Darpö, 'The Wild Has No Words: Environmental NGOs Empowered to Speak for Protected Species as Swedish Courts Apply EU and International Environmental Law' (2013) 10 JEEPL 250.
- 16 A Sustainable Wolf Policy: Government's Proposition (En hållbar rovdjurspolitik: Regeringens proposition) 2012/13:191 [2012] 35 (Swedish).
- 17 Jan Darpö and Yaffa Epstein, 'Thrown to the Wolves—Sweden Once Again Flouts EU Standards on Species Protection and Access to Justice' [2015] *Nordic Environmental Law Journal* 7; Additional Reasoned Opinion (n 10) 10–12, 19.
- 18 Swedish Government's response to the additional reasoned opinion (Svar på kompletterande motiverat yttrande) 19 August 2015; Swedish Environmental Protection Agency, 'Interim Report of the Government Assignment to Investigate Favourable Conservation Status for Wolves' (Delredovisning av Regeringsuppdraget att Utredda Gynnsam Bevarandestatus för Varg) (Swedish) (2015) <<https://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2015/ru-bevarandestatus-varg/Regeringsuppdrag-delredovisning-utreda-gynnsam-bevarandestatus-for-varg-korrigerad%20version.pdf>> accessed 26 January 2015. This report recommends that 300 wolves and the natural immigration and integration into the Scandinavian population of one Finnish or Russian wolf every five years should constitute FCS. While the immigration of wolves happens at a rate of about 1.5 per year according to the report, in fact only three of wolves have been able to reproduce with the Scandinavian wolf population in the past 30 years due to the fact that wolves have not been allowed to exist in Northern Sweden. Because Scandinavia is a peninsula, wolves can only immigrate through the north.
- 19 As of January 2016 when this article was finalised, injunctions by administrative courts prevented hunting from occurring in several counties, while hunting has been allowed to proceed in others. See Judgment of the Sundsvall Administrative Court of Appeal in Cases 2949-15 and 2950-15 (13 January 2016) overturning lower court decisions to grant injunctions in Darlarna and Gävleborg counties (Swedish only); Decision of the Gothenburg Administrative Court of Appeal in Cases 714-15 and 7176-15 (30 December 2015) refusing to hear appeals of lower court injunctions against hunting in Värmland and Örebro counties (Swedish only); Judgment of the Stockholm Administrative Court of Appeal in Case 9476-15 (30 December 2015) upholding an injunction of the lower court against hunting in Västmanland county (Swedish only).

administrative courts.<sup>20</sup> In a recent article, my natural scientist co-authors and I provided a framework for understanding FCS. Our intended audience was biologists and policymakers who were responsible for applying the Habitats Directive.<sup>21</sup> Here, I expand my legal analysis of contested aspects of FCS and examine some ecological concepts that are necessary to understanding its legal meaning, as well as discuss how this analysis might be applied to potential litigation surrounding wolves in Sweden. But while this article's focus is FCS and Swedish wolves, I hope readers will find it useful to future explorations of the discourse between law, science and policy in environmental decision making.

## 1. MATERIALS AND METHODS

### 1.1 Materials

In analysing the legal concept of favourable conservation status for species as defined in the Habitats Directive, the sources I use are both the binding and non-binding sources of EU law, as well as articles and other materials by natural scientists. The Habitats Directive was enacted to meet the EU's obligations under international agreements, which also guide its interpretation. It primarily implements the Bern Convention on the Conservation of European Wildlife and Natural Habitats.<sup>22</sup> It also partially implements the Bonn Convention on the Conservation of Migratory Species of Wild Animals.<sup>23</sup> The definition for FCS utilised in the Habitats Directive is based on that of the Bonn Convention, so the Bonn Convention may be particularly instructive in interpreting that provision. The Habitats Directive was developed at the same time as the Convention on Biological Diversity (CBD),<sup>24</sup> and the influence of that Convention is also clear in the text of the Habitats Directive, which, such as the CBD, seeks to ensure biodiversity.<sup>25</sup> The EU's current biodiversity strategy enacted pursuant to the CBD, or rather the Aichi Targets enacted thereunder, explicitly links implementation of the Habitats Directive to meeting EU obligations under the CBD.<sup>26</sup>

20 Darpö and Epstein (n 17).

21 Yaffa Epstein, José López-Bao and Guillaume Chapron, 'A Legal-Ecological Understanding of Favourable Conservation Status for Species in Europe' (2015) *Conserv Lett* (forthcoming) <<http://onlinelibrary.wiley.com/doi/10.1111/conl.12200/abstract>> accessed 26 January 2016.

22 Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1979 ETS 104. On the relationship, see Second Report by the Committee on the Environment, Public Health and Consumer Protection on the proposal from the Commission to the Council for a directive on the protection of natural and semi-natural habitats and of wild fauna and flora, A 3-0254/90 (18 October 1990), 70 and Yaffa Epstein, 'The Habitats Directive and Bern Convention: Synergy and Dysfunction in Public International and EU Law' (2014) 26 *GIELR* 139.

23 Second Report by the Committee on the Environment, Public Health and Consumer Protection (n 22), 70.

24 Convention on Biological Diversity 1760 UNTS 79 (1992).

25 Biodiversity protection was not mentioned in the goals of the Bern Convention or earlier implementing legislation such as the Wild Birds Directive (now consolidated in European Parliament and Council Directive 2009/147/EC of 30 November 2009 on the Conservation of Wild Birds [2010] OJ L20/7 (hereafter the Birds Directive)).

26 European Parliament resolution of 20 April 2012 on our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011/2307(INI)). Included in the biodiversity strategy is 'the need to halt the deterioration in the status of all species and habitats covered by EU nature conservation legislation and

The Birds Directive<sup>27</sup> also implements the Bern Convention and is similar to the Habitats Directive in many respects. For example, Article 9 of the Birds Directive allowing for derogation from prohibitions on hunting mirrors Article 16 of the Habitats Directive, which also allows derogation in limited situations. The Habitats Directive also explicitly amended the Birds Directive with respect to certain provisions on habitat conservation.<sup>28</sup> Thus, the CJEU's analysis of the Birds Directive is often relevant to the Habitats Directive as well, particularly pertaining to the granting of derogations.<sup>29</sup> The Birds Directive does not use the concept of FCS, however; instead, it requires Member States to take measures to maintain bird populations 'at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or adapt the population to that level'.<sup>30</sup> The vaguer goals of the Birds Directive were explicitly rejected in favour of the more closely defined FCS when drafting the Habitats Directive. The European Commission's original proposal for the Habitats Directive modelled its goals after those stated in the Birds Directive. Both the Economic and Social Committee (ESC) and the Committee on the Environment, Public Health and Consumer Protection (CEPHCP) criticised the unclear conservation goals stated in the 1988 proposal, and suggested the use of the concept of FCS based on the definition from the Bonn Convention.<sup>31</sup> The ESC stated: 'The importance of establishing clear aims and objectives cannot be overestimated. Without such aims and objectives the Directive may suffer from a fate similar to that of the Birds Directive.'<sup>32</sup> It went on to argue: 'It is important to define clear objectives for this Directive' and recommended the definition should be based on that in the Bonn Convention.<sup>33</sup> This was adopted in the final version of the Habitats Directive. Clearly, the intention was to reject the loose conservation goals of the Birds Directive. The Birds Directive is thus less useful as an interpretation tool for FCS than for other aspects of the Habitats Directive.<sup>34</sup>

achieve a significant and measurable improvement in their status at EU level; stresses that this should take the form of an improvement in at least one of the parameters for conservation status as defined in Article 1 of the Habitats Directive, without any deterioration in the other parameters.' [21]; Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets (UNEP/CBD/COP/DEC/X/2 29 October 2010) <<https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-02-en.pdf>> accessed 26 January 2016.

27 Birds Directive (n 25).

28 art 7, Habitats Directive states that its art 6 replaces art 4, Birds Directive.

29 Commission, 'Guidance Document on the Strict Protection' (n 7); citing Case C-6/04 Commission v UK [2005] ECR 9017.

30 art 2, Birds Directive (n 25).

31 art 1(1)(c), Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1651 UNTS 333 (1979). For a discussion of this see Second Report by the Committee on the Environment, Public Health and Consumer Protection (n 23) 75; Economic and Social Committee, Opinion on the proposal for a Council Directive on the protection of natural and semi-natural habitats and of wild fauna and flora and on the Supplementary Annexes, OJ C31/1 (18 October 1990) [1.3].

32 Economic and Social Committee (n 31) [2.6].

33 *ibid* [3.2.2].

34 The FCS concept has however come to be read into the Birds Directive by the European Commission. Guidance from the European Commission which says 'although the term [FCS] is not explicitly mentioned in [the Birds Directive], the principles underpinning it are equally applicable' to the objectives of the Birds Directive. Commission, 'Guide to Sustainable Hunting under the Birds Directive' (2007) 23

Guidance documents from the European Commission constitute non-binding sources of law, and, as is the case here, are often written by natural scientists rather than lawyers and offer guidance of a scientific or technical nature for compliance with EU law. The Commission has explained its understanding of FCS in several guidance documents. These documents interpret the Directive in light of CJEU case law and principles of EU law, as well as advise Member States of its own interpretations and recommended practices for compliance.<sup>35</sup> The Commission released guidance documents articulating how Member States should report FCS in connection with the obligation to report under Article 17 in 2006 and again in 2011.<sup>36</sup> Another guidance document from 2007 dealt specifically with the strict protection of animal species.<sup>37</sup>

Additionally, the Large Carnivore Initiative for Europe (LCIE), a group of experts with backgrounds mainly in the natural sciences, was engaged by the European Commission to produce the 2008 Guidelines for Population Level Management Plans for Large Carnivores.<sup>38</sup> These guidelines advocate the creation of management plans for large carnivores at the population level and, as the title indicates, recommends how this should be done.<sup>39</sup> They also propose working definitions for terms used in the Directive, such as FCS and population viability. Directorate General (DG) Environment commissioned these guidelines and recommended them as best practices.<sup>40</sup> Like the other guidance documents issued by the Commission, they are not legally binding. Rather, they ‘constitute a reference point against which DG

<[http://ec.europa.eu/environment/nature/conservation/wildbirds/hunting/docs/hunting\\_guide\\_en.pdf](http://ec.europa.eu/environment/nature/conservation/wildbirds/hunting/docs/hunting_guide_en.pdf)> accessed 26 January 2016. The same guidance states that hunting of birds is not allowable if they have an ‘unfavourable conservation status’, 59, 64. The CJEU, however, has not seemed to have embraced this shift in language. In 2009, for instance, the court continued to refer to the necessity of maintaining bird populations at ‘satisfactory levels’: Case C-76/08 *Commission v Malta* [2009] [59]. The fact that the bird in question was considered by the IUCN to be ‘of least concern’ was noted, whereas FCS according to the Habitats Directive was not discussed. This may indicate that the Court does not equate ‘satisfactory level’ under the Birds Directive with FCS [62].

35 Especially Commission (n 29) 4–5.

36 Commission, ‘Assessment, Monitoring and Reporting under Article 17 of the Habitats Directive: Explanatory Notes and Guidelines’ (2006) (hereafter 2006 Guidelines) <[https://www.bfn.de/fileadmin/MDB/documents/themen/natura2000/ec\\_guidance\\_2006\\_art17.pdf](https://www.bfn.de/fileadmin/MDB/documents/themen/natura2000/ec_guidance_2006_art17.pdf)> accessed 26 January 2016; Douglas Evans and Marita Arvela, ‘Assessment and Reporting under Article 17 of the Habitats Directive: Explanatory Notes & Guidelines for the Period 2007-2012’ (2011) (hereafter 2011 Guidelines). Assessment of FCS, according to the Commission, must be based on four parameters: population, range, habitat and future prospects. The first three of these correspond to the three necessary components of FCS included in the article 1 definition. ‘Favourable reference values’ for them must be based on purely scientific grounds according to Commission guidance. Each of the three components contains a requirement for prediction—Member States must assess how well the three requirements will be met in the future as well as in the present. Future prospects must be evaluated taking into account both scientific and political considerations. 2011 Guidelines (n 36) 15.

37 Commission (n 29).

38 Large Carnivore Initiative for Europe, ‘Guidelines for Population Level Management Plans for Large Carnivores’ (2008) 6 (hereafter LCIE Guidelines) <[http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/guidelines\\_for\\_population\\_level\\_management.pdf](http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/guidelines_for_population_level_management.pdf)> accessed 26 January 2016.

39 *ibid.*

40 Commission, ‘Note to the Guidelines for Population Level Management Plans for Large Carnivores’ (2008) <[http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/guidelines\\_for\\_population\\_level\\_management\\_ec\\_note.pdf](http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/guidelines_for_population_level_management_ec_note.pdf)> accessed 26 January 2016.

Environment will monitor the actions taken by the Member States in fulfilment of their obligations under the Habitats Directive'.<sup>41</sup> The guidelines seem to be somewhat less indicative of the positions to be taken by the Commission than the Commission's own guidance documents. For example, the LCIE guidelines seem to support allowing hunting to promote the social acceptance of carnivores in a broader range of circumstances than do the Commission's guidelines.<sup>42</sup> The Commission argued in its infringement proceeding against Sweden that it has not been shown that allowing hunting does in fact increase local acceptance.<sup>43</sup> It is not surprising that the Commission has sometimes diverged from the positions taken in the LCIE's guidelines, as, while informative and well-reasoned, the purpose of these guidelines is to offer practical advice for carnivore management from an ecological perspective, rather than legal analysis.

## 1.2 Methodology

The concept of FCS integrates both legal and ecological elements. Therefore, multiple analytical methodologies are used. My starting point is EU law method, which includes textual, teleological and contextual analysis of the law, in light of the jurisprudence of the CJEU and other binding and non-binding sources of EU law described above.<sup>44</sup> I additionally utilise a critical environmental law method. By critical environmental law method, I mean simply that concepts and sources from the environmental sciences are used to argue for how the law should be understood. Critical environmental law is a term that has been used by Andreas Philippopoulos-Mihalopoulos to indicate the use of postmodern theories shared with sociology and linguistics.<sup>45</sup> He describes the necessarily interdisciplinary nature of environmental law and law in general.<sup>46</sup> I also choose this term to indicate a shared heritage with other critical legal movements, which demonstrated that concepts within law that are presumed to be natural or neutral are contingent or in fact promote the values of hegemonic actors.<sup>47</sup> Using interdisciplinary perspectives to reveal biases in the law, critical movements lifted voices often subordinated in traditional analysis. Here, the voice lifted is that of the species protected by environmental legislation, which

41 *ibid.*

42 LCIE Guidelines (n 38) 30.

43 The Commission's guidance had been admittedly unclear, noting that allowing hunting is thought to positively impact social acceptance of lynx in Latvia. Commission (n 29) 57–58. The Latvian lynx, it was also noted, was at FCS. See also, Jan Darpö and Yaffa Epstein, 'Under Fire from All Directions: Swedish Wolf Management Hunting Scrutinized by Brussels and at Home' in Charles-Hubert Born and others (eds), *The Habitats Directive in its EU Environmental Law Context: European Nature's Best Hope?* (Routledge 2015) 357.

44 Koen Lenaerts and José Gutiérrez-Fons, 'To Say What the Law of the EU Is : Methods of Interpretation and the European Court of Justice' (2013) AEL Working Paper 2013/09 <<http://hdl.handle.net/1814/28339>> accessed 26 October 2015.

45 Andreas Philippopoulos-Mihalopoulos (ed), 'Towards a Critical Environmental Law', in their *Law and Ecology: New Environmental Foundations* (Routledge 2011).

46 Andreas Philippopoulos-Mihalopoulos, 'Epistemologies of Doubt' in Anna Grear and Louis Kotzé (eds), *Research Handbook on Human Rights and the Environment* (Edward Elgar Publishing 2015) 28, 42.

47 For a recent critical environmental analysis demonstrating the instability of the concept of 'ecosystem approach', see Vito de Lucia, 'Competing Narratives and Complex Genealogies: The Ecosystem Approach in International Environmental Law' (2015) 27 JEL 91.



communicate not with words but with their behaviour, their demographics and their genes. The use of an interdisciplinary perspective accords with the environmental law method developed by Swedish legal scientist Staffan Westerlund, who also advocated the assessment of environmental laws from the point of view of the protected object.<sup>48</sup> While critical environmental methods may be used to critique the law or legal structures from an external perspective, I focus on demonstrating where concepts from the environmental sciences are needed to make the law legible in the first place, making such concepts internal to the law.<sup>49</sup> My process is reciprocal; the law is used in turn to interrogate these scientific concepts. It is by now uncontroversial within the academy that values play a role in the scientific finding of fact.<sup>50</sup> Where application of the law is dependent on determination of scientific facts, the construction of these facts is examined, for example, the concept of viability.

## 2. FAVOURABLE CONSERVATION STATUS FOR SPECIES

As stated in the introduction, the definition of FCS for species contains several contested elements. The first prong of the definition requires that species maintain themselves on a long-term basis as viable components of their natural habitats. What it means for a species to be a viable component of its natural habitat has been particularly controversial. It has sometimes, as in Sweden, been read as merely requiring the species to be 'viable'. This error stems from a preliminary note for the preparation of guidance documents on how Member States should monitor, assess and report their implementation of the Habitats Directive as required by Article 17. This note proposed the use of favourable reference values (FRVs), including favourable reference population (FRP) to assess FCS. It defines the FRP as 'the population in a given biogeographical region considered the minimum necessary to ensure the long-term viability of the *species* [emphasis in original]', along with other factors.<sup>51</sup> This definition omits the rest of the clause, which requires not the species be viable, but a viable *component* of its natural habitats. To end the analysis with whether the species is viable is to ignore a significant portion of the sentence. It is clear from context that viability must be understood in relation to the role the species plays in the ecosystem of which it is a part, not merely on an analysis of its viability in isolation.

It may be tempting nevertheless to start the analysis by examining what it means to be viable. After all, whatever it means to be a viable component of a natural habitat, it is at least required that a species be viable. This is surely true. However, it is

48 Rakhyun Kim and Klaus Bosselmann, 'International Environmental Law in the Anthropocene: Towards a Purposive System of Multilateral Environmental Agreements' (2013) 2 TEL 285, 287–88.

49 For the argument that critical environmental critiques are by nature internal, see Philippopoulos-Mihalopoulos (n 45) 33.

50 See, eg Lena Wahlberg, *Legal Questions and Scientific Answers: Ontological Differences and Epistemic Gaps in the Assessment of Causal Relations* (Lund University 2010) fn 3: 'It is generally acknowledged that values play a part in science, it has been debated which values do so, and in what way' and citations. There have been many scholarly challenges to the fact/value dichotomy. See, Hilary Putnam, *The Collapse of the Fact/Value Dichotomy* (Harvard UP 2002), especially cc 1, 2 and 8; Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy* (Harvard UP 2004) especially 95–102 (demonstrating the frailty of the concepts of facts and value in the natural sciences); Fisher, (n 4) (addressing this dichotomy with respect to risk regulation).

51 Commission, 'Note to the Habitats Committee' (DocHab-04-03/03\_rev.3) (2005) 9.

impossible to understand the meaning of the word 'viable' independently of its context. There are many approaches to assessing viability, each of which may lead to a different result. The choice of which to use is a value judgment that must be made in accordance with the law, as well as best scientific practices. That a species must remain a 'component of its habitat' suggests ecological viability in addition to demographic viability is the correct tool for analysis here.

The LCIE Guidelines for Population Level Management Plans for Large Carnivores explain that there are multiple ways to consider viability, but ultimately recommend the use of a population viability analysis (PVA) to determine minimum viable population (MVP) for demographic viability.<sup>52</sup> They suggest that one of several factors for determining FCS could be an MVP based on the International Union for the Conservation of Nature (IUCN)'s red list criterion E, which considers a species not to be threatened if it has less than 10% chance of extinction in the wild within 100 years.<sup>53</sup> This is a much higher extinction risk than tolerated by many formulations of MVP. For example, MVP was originally and arbitrarily formulated as having a less than 1% chance of extinction within 1,000 years.<sup>54</sup> The extinction risk currently most frequently used in viability analyses by the scientific community is 5% over a time period of 100 years.<sup>55</sup> IUCN's criteria were developed to assess the relative risk of species' extinction globally in order to prioritise conservation action.<sup>56</sup> These criteria have been used by conservation practitioners in other contexts where legal instruments lacked their own standards for evaluation.<sup>57</sup> However, when using criteria created for other contexts, it is important to consider whether the purposes are in fact compatible. The goal of the Habitats Directive is to promote flourishing rather than merely to prevent extinction.<sup>58</sup> Further, the decision to prioritise the conservation of listed species has already been made by virtue of their inclusion in the annexes of the Directive. The utility of the IUCN red list criteria in applying the Habitats Directive should be questioned.

Whether or not a species population is viable is often assumed by non-scientists to be a matter of fact that can be determined by scientists. But as is clear from the use of a PVA, viability cannot be determined without value judgments, literally. Scientists answer the question 'is the population viable' by solving an equation: X % chance that  $N = 0$  in Y years. That is, what is the risk that the number of individual animals will be zero over a particular time period. What risk of extinction over what

52 LCIE Guidelines (n 38) 14–20.

53 IUCN Species Survival Commission, 'IUCN Red List Categories and Criteria' (2012, Version 3.1) 22. It should be noted that while the LCIE supports the use of MVP in determining FCS, it also cautions that FCS requires greater numbers than MVP and 'potentially up to what the potential habitat can support'. LCIE Guidelines (n 38) 17, 20.

54 M Shaffer, 'Minimum Population Sizes for Species Conservation' (1981) 31 *Bio Sci* 131, 132; Luke Harmon and Stanton Braude, 'Conservation of Small Populations: Effective Population Sizes, Inbreeding and the 50/500 Rule' in Stanton Braude and Bobbi Low (eds), *An Introduction to Methods and Models in Ecology, Evolution and Conservation Biology* (Princeton UP 2010).

55 Louette and others (n 3) 28; Curtis Flather and others, 'Minimum Viable Populations: Is There a "Magic Number" for Conservation Practitioners?' (2011) 26 *Trends Ecol Evolut* 307, 308.

56 Georgina Mace and others, 'Quantification of Extinction Risk: IUCN's System for Classifying Threatened Species' (2008) 22 *Conserv Biol* 1424, 1426.

57 *ibid* 1439.

58 2011 Guidelines (n 36) 8.

time span is acceptable is not factually determinable. This does not mean these variables can be determined without regard to science. The law provides a limit on the range of possible political choices, thus mediating between science and public policy. As a matter of law, to be at FCS, it must be true that ‘the species is doing well and likely to do well in the future’; no finding of fact or value not compatible with this legal mandate is permissible.

That MVP could be used in determining FCS was originally mentioned in the 2006 Article 17 Reporting Guidelines.<sup>59</sup> The guidelines cautioned, however, that while MVP could be ‘of use’ in determining FRP, it was ‘by definition different’.<sup>60</sup> The 2011 Article 17 Reporting Guidelines repeated the suggestion that MVP could be one possible method for determining the FRP, but again noted that MVP by definition requires a lower number of individuals than FCS. Neither set of guidelines mentions the use of IUCN’s criterion E in determining MVP. They do indicate that population viability analysis in general is less useful than other approaches for determining the FRP, suggesting a more qualitative approach to FRP, including the consideration of:

- Historic distribution and abundances and causes of change
- Potential range
- Biographical and ecological conditions
- Migration routes and dispersal ways
- Gene flow or genetic variation including clines
- Population should be sufficiently large to accommodate natural fluctuations and allow a healthy population structure.<sup>61</sup>

The Swedish government had mandated in 2013 that SEPA set the FRP between 170 and 270 wolves.<sup>62</sup> It based this number on a population viability analysis commissioned by SEPA. The assignment asked the researcher to determine what was the minimum population of wolves that would have less than 10% chance of extinction after 100 years, assuming that genetic issues had been resolved. In other words, the study parameters were based on Criterion E.<sup>63</sup> The response was that a population of 100 wolves with no genetic issues would meet that criterion. Considering that the Swedish wolf population is not in fact genetically healthy, the value of this study is questionable.<sup>64</sup> Pursuant to the Article 17 guidelines, a ‘larger’ number than MVP was selected. The more qualitative factors recommended by the Guidelines were not considered.<sup>65</sup> SEPA chose the number at the high end of the range, 270, and

59 2006 Guidelines (n 36) 19.

60 *ibid.*

61 2011 Guidelines (n 36) 18.

62 A Sustainable Wolf Policy: Government’s Proposition (En hållbar rovdjurspolitik: Regeringens proposition) 2012/13:191 [2013] 35 (Swedish).

63 Although it should be noted that proper application of Criterion E requires taking into account known threats including genetic factors. See IUCN Standards and Petitions Subcommittee, ‘Guidelines for Using the IUCN Red List Categories and Criteria’ (2014, Version 11) 60–61 <<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>> accessed 26 January 2015.

64 The author of that study has criticised the Government’s application of his results as an ‘abuse of science’. Guillaume Chapron ‘Challenge the Abuse of Science in Setting Policy’ (2014) 516 *Nature* 289.

65 A Sustainable Wolf Policy: Government’s Proposition (n 62) 35; Guillaume Chapron and others ‘Demographic Viability of the Scandinavian Wolf Population: A Report by SKANDULV’ (2012)

stipulated that 2.5 reproducing immigrant wolves per five-year wolf generation was required to constitute FCS.

As the LCIE guidelines acknowledge, there are multiple ways to consider viability. The LCIE, and the Swedish government, chose to focus on demographic viability. The language of the Directive suggests to the contrary that ecological viability, which has to do with the interaction between a species and its habitat, and is a more 'conceptual than quantitative' determination,<sup>66</sup> is the more relevant consideration for this particular clause. 'Viability' cannot be determined separately from its context that a species must be a 'viable component of its natural habitat'. This requires something more than demographic viability; the species' relationship with its habitat must also be considered.

Sweden's decision to set the FRV at 270 was sharply criticised by the European Commission and others for lacking sufficient scientific support and ignoring genetic issues.<sup>67</sup> The necessity for genetic viability is implied by the requirement that to be at FCS, a species must remain a viable component of its natural habitat on a *long-term basis*. The phrase 'long-term' is not further defined in the Directive, and is another term that lacks any concrete scientific definition. However, the general EU law principle of the precautionary principle as well as the objectives declared in the preamble of the Directive, as well as those of the two international conventions it implements, the Bern Convention and CBD, suggest that a species should continue as a viable part of its natural habitat forever. For example, the Bern Convention recognises that species are 'a natural heritage of aesthetic, scientific, cultural, recreational, economic and intrinsic value that needs to be preserved and handed on to future generations'.<sup>68</sup> This indicates a desire to preserve species on a very long time scale. The CBD similarly states a goal of conservation 'for the benefit of present and future generations'.<sup>69</sup> It also notes the importance of maintaining biological diversity for evolution.<sup>70</sup> Given a lengthy enough timeline, the extinction rate is invariably 100%. For a species, or population of a species, to remain viable forever, it is necessary for it to maintain both genetic viability and evolutionary capacity.

There is broad consensus amongst biologists that for a species or population to be genetically viable in the long term, it must have at least 500 effective individuals.<sup>71</sup> The concept of 'genetically effective population size' (referred to as  $N_e$ ) can be roughly defined as the number of individuals who contribute to the genetic diversity of the populations' offspring. When this genetically effective population size is equal to 500, the natural loss of genetic diversity through offspring inheriting half the genetic material of each parent is offset by natural mutations. This means that at  $N_e = 500$ , the population is able to evolve and adapt to future environmental changes. Estimating  $N_e$  is, however, difficult and affected by factors such as whether

<<http://www.lansstyrelsen.se/vastragotaland/SiteCollectionDocuments/Sv/djur-och-natur/rovdjur/varg/Rapport-sarbarhetsanalys-varg-120702.pdf>> accessed 26 January 2015.

66 LCIE Guidelines (n 38) 16.

67 Additional Reasoned Opinion (n 10) [49].

68 Bern Convention (n 22) preamble.

69 CBD (n 24) preamble.

70 *ibid.*

71 Linda Laikre and others, 'Importance of Genetics in the Interpretation of Favourable Conservation Status' (2009) 23 *Conserv Bio* 1378, 1379.

genetic samples are good representatives of the population, which laboratory methods are used, what time period is examined and what the population dynamics were during that time period.<sup>72</sup> It is nevertheless agreed that to ensure a genetically effective population of 500, the actual population must be larger than 500, potentially much larger.<sup>73</sup> While each Member State has an obligation to reach and maintain FCS, however, it may not be possible for each Member State to have over 500 effective members of every listed species, particularly species that need a lot of space such as large carnivores, although it should be noted that some do.<sup>74</sup> Instead, as geneticist Linda Laikre and her co-authors have argued, species populations within states can maintain the necessary genetic variation to remain viable if they are part of a larger population or network of connected population that has the requisite numbers. She suggests that in general, each subpopulation should receive at least one genetically effective new member each generation to maintain sufficient genetic diversity.<sup>75</sup> It is generally agreed, however, that the number of animals must be significantly higher to maintain evolutionary capacity.<sup>76</sup>

While not explicitly stated, the idea that evolutionary capacity, noted above, should be considered in determining FCS is supported by the 2011 Article 17 Guidelines. They recommend Traill and others' article 'Pragmatic Population Viability Targets in a Rapidly Changing World' to those utilising a population viability analysis.<sup>77</sup> This article concludes 'any conservation project that is serious about the long-term survival (and continued ability to evolve) of a species must aim for a meta-population of thousands of individuals'.<sup>78</sup> An often used number is 5,000.<sup>79</sup> Others suggest that an effective population, rather than merely a total population, of 5,000 is needed.<sup>80</sup>

72 For a far more detailed explanation of effective population, as well as a description of difficulties in estimating it, see Robin Waples, 'Definition and Estimation of Effective Population Size in the Conservation of Endangered Species' in Steven Beissinger and Dale McCullough (eds) *Population Viability Analysis* (The University of Chicago Press 2002) 147–68.

73 According to Harmon and Braude (n 54) at 127, some biologists approximate the effective population size at one-fifth of the total population.

74 For instance Romania and Spain each have more than 2000 wolves. Guillaume Chapron and others, 'Recovery of Large Carnivores in Europe's Modern Human Dominated Landscapes' (2014) 346 *Science* 1517. It therefore seems unlikely that it would be impossible for Sweden to meet the requirement for genetic viability, as it is a large country with a much lower human population density than either Romania or Spain.

75 Laikre and others (n 71).

76 Lochran Traill and others 'Pragmatic Population Viability Targets in a Rapidly Changing Worlds' (2010) 143 *Bio Conserv* 28, 31; IR Franklin and R Frankham, 'How Large Must Populations be to Retain Evolutionary Potential?' (1998) 1 *Anim Conserv* 69.

77 2011 Guidelines (n 36) 18.

78 Traill and others (n 76) 31.

79 *ibid.*

80 Russell Lande, 'Mutation and Conservation' (1995) 9 *Conserv Biol* 782. The use of 5000 individuals as a prerequisite for FCS has been adopted in Flanders, Belgium. For most species, the FRP is 5000 individuals within the Flemish region. Groups of individual members of a species may be smaller than 5000 if they are connected to other groups. Generally, species for which there were less than 5000 individuals within Flanders were considered to have less than favourable conservation status. For species that are wide ranging and connected to larger populations outside of Flanders, such as some species of bats, conservation status was considered to be favourable if the number of individuals remained stable. The use of 5000 as minimum viable population across species has however thus far not been used outside of

As indicated by the scientific literature and guidance documents discussed above, both the European Commission and the scientific community agree that the genetic health of a population should be considered in determining conservation status, as it clearly is relevant to the long-term flourishing of a population. The October 2015 report from SEPA discussed genetic factors noting the  $N_e = 500$  formulation in finding that 1,700 wolves constitute a genetically viable population.<sup>81</sup> However, SEPA assumed that Sweden could include wolves in Finland, Russia, Norway, Poland and the other Baltic states to reach the genetically viable population required by FCS, as long as at least one immigrant wolf entered Sweden and bred with the Swedish population every five years.<sup>82</sup> This is a reduction from a previous goal of 2.5 immigrant wolves per wolf generation, which was not achieved.<sup>83</sup> The goal of one per generation has not currently been met either. SEPA further decided that 300 wolves constituted FCS in Sweden, referring to another formulation of MVP based on a likelihood of less than 5% genetic loss over 100 years and an assumption of one immigrant wolf per generation.<sup>84</sup> Swedish authorities implied that long-term genetic viability need not be achieved by Sweden alone, and counted foreign wolves, including those outside the EU, in considering the population size.<sup>85</sup> The concept of FCS may not require Sweden to have a population with evolutionary capacity, or perhaps even genetic viability, solely within its borders, if its wolves are connected through regular genetic exchange to a population that does have evolutionary capacity. As will be discussed below, however, regular genetic exchange between Swedish wolves and other populations does not currently occur.

Another requirement for a species to be considered to be at FCS is that it maintains itself. It is unclear from the text whether this means that species may not be considered to have reached FCS if human management is required. The Scandinavian wolf population, for example, is severely inbred due to a lack of connectivity with the neighbouring Finnish/Karelian populations. While wolves from those populations have frequently attempted to disperse into northern Sweden, they are almost always killed through hunting justified on the basis that it is preventing serious damage to livestock or, most likely, by poachers.<sup>86</sup> Therefore, the wolves do not reach the Scandinavian population, which is concentrated in central Sweden. The current wolf management plan calls for SEPA to take measures such as relocating immigrant wolves from northern to central Sweden, and moving genetically

Flanders. Natural England, 'Review of Favourable Conservation Status and Birds Directive Article 2 Interpretation within the European Union' (2015) 23.

81 Swedish Environmental Protection Agency (n 18) 9.

82 *ibid.*

83 The Swedish Environmental Protection Agency, National Administrative Plan for Wolves (Nationell Förvaltningsplan för Varg) 2014–2019 (Swedish) (2014) 26 called for 2.5 immigrant wolves per five-year period assuming a total Swedish population of 270, or 1 immigrant wolf per five-year period assuming a total Swedish population of 370 <<http://www.naturvardsverket.se/upload/miljoarbete-i-samhallet/miljoarbete-i-sverige/regeringsuppdrag/2014/forvaltningsplaner-rovdjur/nationell-forvaltningsplan-varg.pdf>> accessed 26 January 2016.

84 Swedish Environmental Protection Agency (n 18) 9.

85 *ibid.*

86 See Olof Liberg and others, 'Shoot, Shovel and Shut Up: Cryptic Poaching Slows Restoration of a Large Carnivore in Europe' (2012) 279 *Proc R Soc B* 910 (arguing that poaching was the most likely explanation for a lower than expected rate of population growth of the Scandinavian wolf population).

healthy pups raised in captivity to wild dens.<sup>87</sup> These measures have not thus far been successful at integrating immigrant wolves into the Scandinavian gene pool.<sup>88</sup> But were they successful, it is nevertheless unclear whether a population dependent on human-assisted translocation rather than connectivity can be said to be ‘maintaining itself’ within the meaning of the Directive. The European Commission has criticised Sweden’s attempts to achieve genetic diversity through the relocation of foreign wolves rather than allowing natural connectivity with Finland to develop.<sup>89</sup>

An examination of the Directive in its other languages shows that the reflexive pronoun ‘itself’ is not consistently used. EU legislation is equally valid in each of its 24 authentic languages.<sup>90</sup> While the reflexive is used in several languages, it is not in others. The French version, for example, requires that the species ‘*continue et est susceptible de continuer*’, which more literally means that the species must ‘continue and be likely to continue’ on a long-term basis. The Swedish version, which requires that a species ‘*kommer att förbli*’ (is going to remain) a viable part of its habitat, is more similar to the French than the English. The German and Spanish versions also eschew the reflexive. Other versions, for example Latvian, follow the English more closely, requiring that a species ‘*sevi atražo*’, literally ‘reproduce itself’.

Another document that might be looked at to support a textual interpretation is the source material, the Bonn Convention. Like the Habitats Directive, the English version of the Bonn Convention uses the reflexive phrase ‘maintaining itself.’<sup>91</sup> But again, this reflexive is not consistently used: the French version reads ‘*continue et continuera à long terme*’, ‘continue and will continue in the long term’, while the Spanish version states ‘*continuará por largo tiempo*’, the species should ‘continue for a long time’. It remains unclear from a textual interpretation whether it is necessary for FCS that species be viable wholly without human intervention.

If different versions of the legislation seem to support different meanings, the court finds a uniform interpretation by interpreting the contested passage ‘by reference to the purpose and general scheme of the rules of which it forms a part.’<sup>92</sup> The question, therefore, becomes the extent to which human management is compatible with the Habitats Directive’s goals. In recognition of the fact that there remains little or no EU territory that has not been impacted by human activity, the Directive defines ‘natural habitat’ to include both the ‘entirely natural’ and ‘semi-natural’.<sup>93</sup> While

87 Swedish Environmental Protection Agency (n 83) 27.

88 One immigrant wolf pair (the so-called ‘Tiveden pair’) has been successfully relocated from northern Sweden; however, its offspring have not yet bred with the local population and many have already been killed. Swedish Environmental Protection Agency, Another Wolf Pup from Tiveden Killed in Traffic (Ännu en vargvalp från Tiveden dödad i trafiken) (Press release, Swedish) (2015) <<http://www.naturvardsverket.se/Nyheter-och-pressmeddelanden/Annu-en-vargvalp-fran-Tiveden-dodad-i-trafiken/>> accessed 26 January 2016.

89 Commission, Additional Reasoned Opinion in Infringement Proceeding 2010/4200 (n 9) 12–14.

90 Case C-296/95 *EMU Tabac* [1998] ECR I-1605, [36].

91 art I(c)(1) Bern Convention (n 22).

92 Case 30/77 *Bouchereau* [1977] ECR 1999, [14].

93 art 1(b) Habitats Directive (n 1).

human activity may often threaten natural habitats, in many situations, human activity is necessary to reach or maintain FCS.<sup>94</sup>

For example, the market-driven displacement of alfalfa by corn led to a serious threat to the hamster population of Alsace in France. The Court of Justice required that France resume growing alfalfa or other plants necessary to the hamster's recovery.<sup>95</sup> If the hamster is to reach FCS, certain human agricultural activity must continue. If a species requires human intervention to maintain its habitat, a Member State may be required to undertake measures necessary to do so. If the species does well in that human-maintained environment, it can be considered to be at FCS regardless of the need for continued intervention.

The Habitats Directive does not, however, envision that species will be entirely dependent on human intervention to populate their habitats. This is also not in line with its purpose. The goal of the Habitats Directive, which must also be understood in light of the goals of the international agreements that it implements, is to conserve species in their natural habitats within a 'coherent European ecological network' as part of a functioning ecosystem.<sup>96</sup> While habitats need not be 'entirely natural' and some human management is tolerated or even necessary, at some point of human intervention, a species can no longer be considered to be a component of a natural habitat at all. For example, if a species existed in a natural habitat solely because a management agency released individuals into the area and the animal did not breed in the wild at all, that would be at odds with the goals of the Directive. What is 'natural' as opposed to 'human', and the distinction between these concepts itself, have been called into question many times over,<sup>97</sup> and it is not possible to state as a matter of law where or if that boundary lies. A species may receive assistance in maintaining its populations. At the same time, multiple language versions of the Directive do employ some form of the reflexive, suggesting some limitations on the amount of human help required to maintain the species if it is to be considered at FCS.

One possible limit to the amount of human help required may be human help that requires ongoing derogation from strict protection. Strict protection under the Habitats Directive requires that Member States ban not only killing, but also the

94 According to the Directive's preamble, maintaining biodiversity may 'in certain cases require the maintenance, or indeed the encouragement, of human activities' (ibid). According to Lubos Halada and others, 'Which Habitats of European Importance Depend on Agricultural Practices?' (2011) 20 *Biodivers Conserv* 2365, 63 out of 231 (about 27%) natural habitat types protected in Annex I of the Habitats Directive require agricultural management.

95 Case C-383/09 *Commission v France* (n 9). Between 2001 and 2007, the Court noted, the number of hamster burrows in the region fell from more than 1160 to less than 180, and no hamster population within the region was at minimum viability, which had been estimated as 1500 individuals [24]. This case is notable because it shows a willingness by the court to use the concept of minimum viable population based on  $N_e = 500$  in its analysis, though it does not explicitly connect it to FCS. It also provides some examples of indicators that FCS has not been reached, that is, lack of viability and a reduction in burrows of over 80%.

96 Preamble, Habitats Directive (n 1) and Preamble Bern Convention (n 22).

97 William Cronon, 'The Trouble with Wilderness; or, Getting Back to the Wrong Nature' in William Cronon (ed), *Uncommon Ground: Rethinking the Human Place in Nature* (WW Norton & Co 1995), 69–90.



deliberate capture and disturbance of members of the species, which is usually required for relocation.<sup>98</sup> Derogation from strict protection is of course permitted when it would benefit the protected species.<sup>99</sup> Conceptually however, it would be difficult to argue that a population dependent on continual intervention that in itself requires that exceptions from strict protection be made has reached FCS. This may form one of the outer limits of the allowable discretion in deciding how much human assistance is acceptable.

To qualify as having reached FCS, species should belong to a functional ecosystem. Consequently, if management is required, that intervention should be limited. In the case of the Swedish wolf, wolves have been reproducing in the wild without human intervention. The population currently shows signs of inbreeding depression, however, and, unless policies change to allow wolves to survive in northern Sweden, genetic rescue through human intervention will likely be needed on a regular basis. This continued dependence on human-assisted genetic rescue may disqualify the population from FCS, even if translocation is successful.

The definition of FCS for species does not include any explicit dictat to improve the status quo. Nevertheless, there are some indications that improvement in population, habitat or range may be required in order for a species to be considered at FCS in some circumstances. Most obviously, the listing of a species in the Annexes of the Habitats Directive implies that the species is not flourishing, or was not flourishing in at least part of its range at the time of inclusion in its annexes of protected species. This is because the Directive aims to achieve and maintain the FCS of species ‘of Community interest’, which is defined as species that are endangered, vulnerable, rare or endemic with the EU.<sup>100</sup> Commission guidance recommends considering not only current range, but historic range in setting the goal, or FRV, for a species range, and considering historic population abundance, and potential range when determining the FRP.<sup>101</sup>

It should be noted that ‘historic population’ and ‘historic range’ are again terms that require value judgments—there is no single correct answer as to the appropriate time in history at which to set these baselines.<sup>102</sup> This issue is sometimes known within conservation science as the ‘shifting baseline’ phenomena, in which scientists measure change using a baseline of number of animals at the beginning of the scientist’s own career.<sup>103</sup> There is no objective reason for choosing this timescale rather than looking 50 years back or 100 years or 1,000 or 10,000 when there may have been more or less members of the species extant. Surprisingly however, although

98 art 12 Habitats Directive (n 1). Relocating animals from outside the EU or from captivity would however likely not violate this prohibition.

99 art 16 *ibid*.

100 art 1(g), *ibid*. See also Douglas Evans and others, ‘Adapting Environmental Conservation Legislation for an Enlarged European Union: Experience from the Habitats Directive’ (2013) 40 *Env Conserv* 97, 99 for a description of the species selection process when amending the Directive Annexes.

101 2011 Guidelines (n 36) 16–17. See Tim Coulson and others, ‘The Use and Abuse of Population Viability Analysis’ (2001) 16 *Trends Ecol Evolut* 219, 219.

102 Coulson and others (n 101).

103 John Pinnegar and Georg Engelhard, ‘The “Shifting Baseline” Phenomenon: A Global Perspective’ (2008) 18 *Rev Fish Biol Fisher* 1; The term ‘shifting baseline’ was coined in Daniel Pauly, ‘Anecdotes and the Shifting Baseline Syndrome of Fisheries’ (1995) 10 *Trends Ecol Evolut* 430.

inclusion as a listed species of Community interest would seem to imply that the species is not at FCS, many Member States use the range and population at the time that the Directive entered into force, or the population in 2007 when the first data reporting for species populations became available, as the baseline reference for FCS.<sup>104</sup> While it may be ambiguous which historic baselines should be used in determining FRVs, 'historic' figures from a time when the species had been designated 'endangered, vulnerable, rare or endemic' are surely the wrong baselines for favourability.

Even with the relatively low standards for setting FRPs and other reference values, most species are not at favourable conservation status.<sup>105</sup> It is clear after the *Alsace Hamster* case that Member States must endeavour to restore the habitats and populations of species that are not flourishing.<sup>106</sup> To what extent, however, must a population that is flourishing improve in terms of numbers or range to be considered at FCS?

In the majority of cases, Sweden uses the common approach of setting FRVs based on the range and populations in 1995, the year the Directive entered into force in Sweden.<sup>107</sup> Exceptions to this method of determining the FRP are made, particularly for controversial species such as wolves.<sup>108</sup> As noted above, Sweden's FRP for wolves was set at 270 in 2013, a number 'larger' than its calculated minimum viable population of 100, and as of late 2015, determined by SEPA to be 300.<sup>109</sup> The favourable reference range is defined as all of Sweden including the reindeer herding area in the northern half of the country, with the exception of the Alpine region, which makes up the border with Norway, and Gotland County, which is an island off the mainland's southeast coast.<sup>110</sup> Be that as it may, as noted above, wolves have not been permitted to settle in Sweden's northern half, alpine or otherwise, despite its necessity to achieving natural connectivity with other populations. Even if, as argued in the previous section, a species may be considered to be at FCS even if some continued level of management is required, restrictions on the natural improvement to a species' range or habitat that prevent the species' ability to maintain themselves by limiting connectivity would seem contrary to the intent of the Habitats Directive.

There is some additional textual support for the notion that FCS may require an improvement in how much space the species actually inhabits, even if the populations are capable of surviving on a long-term basis without expansion of their territory. FCS requires that a species' range is not being reduced or likely to be reduced in the future. Range would seem to be a so-called one-way ratchet that must always be stable or increasing in order for FCS to be achieved. But FCS also requires that a species be a viable component of its natural habitats. 'Habitat of a species' is defined

104 Natural England (n 80) 1–2.

105 European Environment Agency, 'State of Nature in the EU' (European Environment Agency 2015) 7.

106 A Cliquet and others, 'Restoring Nature in the EU: The Only Way Is Up?' in Charles-Hubert Born and others (eds), *The Habitats Directive in Its EU Environmental Law Context: European Nature's Best Hope?* (Routledge 2015).

107 Natural England (n 80) 97.

108 *ibid* 97.

109 Swedish Environmental Protection Agency (n 83) 26; Swedish Environmental Protection Agency (n 18) 7.

110 A Sustainable Wolf Policy (n 16) 35.

as ‘an environment defined by specific abiotic and biotic factors, in which the species lives at any stage of its biological cycle’.<sup>111</sup> This contains an ambiguity: it is unclear whether a species’ habitat includes only environments in which it *actually* lives during its lifecycle, or the types of environment in which the species *typically* lives. It is equally natural, for example, to say, ‘frogs live in that pond’ and mean that frogs currently occupy a particular pond, or ‘frogs live in ponds’ and mean that ponds are a type of environment in which frogs typically live. Both conceptions of ‘habitat’ are used by ecologists.<sup>112</sup> If the latter interpretation is correct, a species may need to occupy habitats that it does not currently in order to be considered a viable component of its habitats. That is, an otherwise flourishing population that only fills a small portion of available habitats may be insufficient. It should also be noted that ‘habitats’ is plural, implying that the species should be present in its various habitat types. On the other hand, an analysis of the Habitats Directive’s preparatory works indicates there was not an intention to require Member States to seek to grow its species populations towards historical levels or to fill potential range in order to be considered at FCS. As noted in Section 1, early drafts of the Habitats Directive did not require the directive to achieve FCS, but rather the nebulous instructions adapted from the Birds Directive—member states were to maintain species at ‘satisfactory’ levels corresponding to ‘ecological, scientific and cultural requirements’.<sup>113</sup> Both the ESC and CEPHCP objected to these vague terms on the grounds that they had proven ineffective, and suggested using the concept of FCS as defined in the Bonn Convention.<sup>114</sup> The CEPHCP suggested using nearly identical language to that in the Bonn Convention, which includes the three criteria currently used in the Habitats Directive, plus a fourth: ‘the distribution and abundance of the migratory species approach historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent consistent with wise wildlife management.’<sup>115</sup> The ESC recommendation, on the other hand, used only the first three criteria from the Bonn Convention.<sup>116</sup> The European Parliament’s proposed version of 19 November 1990 took the CEPHCP’s approach and proposed amending the Commission’s proposal to include a definition of FCS based on that in the Bonn Convention, and including all four of its elements.<sup>117</sup> The enacted version of the Directive of course accepted the ESC’s recommendation. This implies that the legislators intentionally rejected requiring that species populations approach historical levels.

111 art 1(f) Habitats Directive (n 1).

112 Michael Kearney, ‘Habitat, Environment and Niche: What Are We Modeling’ (2006) 115 *Oikos* 186.

113 Proposal for a Council Directive on the protection of natural and semi-natural habitats and of wild fauna and flora [1988] OJ C 247/3, arts 2 and 17. This was based on the preamble para 10 and art 2 of the Birds Directive.

114 Second Report by the Committee on the Environment, Public Health and Consumer Protection (n 23) 75; Economic and Social Committee, (n 31) [1.3] and [3.2.2].

115 art 1(c) Bonn Convention (n 31).

116 Economic and Social Committee (n 31) [3.2.2].

117 Legislative Resolution embodying the opinion of the European Parliament on the proposal from the Commission to the Council for a directive on the protection of natural and semi-natural habitats and of wild fauna and flora, A3-254/90, [1990] OJ C324/71; Texts adopted by the European Parliament, Proposal for a Council directive on the protection of natural and semi-natural habitats and of wild fauna and flora, Amendment no 8, [1990] OJ C-324/24.

The use of historical distribution and potential range in determining the FRP is however, as noted above, recommended by both the 2006 and 2011 Article 17 reporting guidelines. The 2006 guidelines explicitly supported the position that a small and localised population could be considered at FCS even if it would be considered threatened using IUCN criteria.<sup>118</sup> The 2011 guidelines did not contain this language. Whether or not this change represents a substantive change in position by the Commission, it should be noted that the new guidelines superseded the old ones.<sup>119</sup> However, in light of the EU's 2012 Biodiversity Strategy's statement that the status for 'all species and habitats covered by EU nature conservation legislation' should improve significantly, in the form of an improvement of 'at least one of the parameters for conservation status defined in Article 1 of the Habitats Directive', it seems that improvement in status is promoted if not required.<sup>120</sup> It is at least a recommended management practice if not legally required that species populations continue to grow in terms of their numbers and range in order to be viable components of their natural habitats.

A related question is whether the FRP should be measured from extinction or carrying capacity, that is, the largest number of individuals that can be supported by the habitat. This is a question that seems to be left to the discretion of the Member States and Sweden had, in its decision to select an FRP that is 'larger' than the minimum viable population has chosen to measure the from extinction.<sup>121</sup> It would however be more logical to use carrying capacity than extinction. The Commission's guidelines suggest that the former measure is most appropriate, as FCS corresponds to the 'distance from some favourable state' and not distance from extinction.<sup>122</sup> To measure from carrying capacity is more consonant with the concept of FCS. In other words, if the FRP value is based on distance from extinction, then conservation status would be indirectly measured from extinction. Carrying capacity, as an even more favourable state than FCS, offers a more logically consistent conceptual tool with which to assess FCS. The 2011 Guidelines also indicate the utility of using carrying capacity instead of extinction, and provide an example of how this has been implemented.<sup>123</sup>

The crucial question remains at what level or scale this demographically, ecologically and genetically viable population with evolutionary capacity must be maintained. The terms 'scale' and 'level' are often used differently in different disciplines. Here, 'scale' is used to denote a hierarchical framework, and 'level' to denote a point along a scale.<sup>124</sup> Multiple scales are in play in the Habitats Directive: some political in nature and others ecological. The first type considers national and other political boundaries, while the second considers subpopulations, populations, meta-populations, habitats, ecosystems and biogeographical regions.

118 2006 Guidelines (n 36) 15.

119 2011 Guidelines (n 36) 6.

120 *Our Life Insurance, Our Natural Capital: an EU Biodiversity Strategy to 2020* [2013] OJ CE-258/99, 103 para 21.

121 *A Sustainable Wolf Policy* (n 16) 35.

122 2011 Guidelines (n 36) 9.

123 *ibid* 18.

124 See definitions in Helene Ahlborg and Andrea J Nightingale, 'Mismatch Between Scales of Knowledge in Nepalese Forestry: Epistemology, Power, and Policy Implications' (2012) 17 *Ecol Soc* 16.

'Population' is, of course, another term without a clear scientific meaning. Populations can be defined by spatial, political, genetic or ecological factors, or merely refer to a group of animals being studied as defined by a particular study.<sup>125</sup> For example, one might refer to the Swedish wolf population, and mean those individual wolves that happen to find themselves within the political borders of Sweden at a particular time, or to the Scandinavian wolf population, and mean the biologically defined group of wolves located on the Scandinavian Peninsula. A review listed a 'representative sample' of 18 definitions of population and related concepts.<sup>126</sup> The LCIE discusses the open texture of this term 'population' and operationally defines it as a hierarchical concept consisting of meta-populations, subpopulations and population segments. Meta-populations are the largest unit in this hierarchy, and are made up of animals that share 'a broadly similar genetic structure' that may be dispersed over a large area but have some degree of reproductive connectivity, if only 'a few individuals per generation'.<sup>127</sup> Subpopulations are groups of individuals 'that interact with much greater frequency such that the demography of the group is mainly influenced by birth and death rates rather than the immigration of animals from outside'.<sup>128</sup> Clusters within a subpopulation are known as population segments.<sup>129</sup> The LCIE guidelines use their definition of subpopulation as the basic definition of population. Even so defined, populations are difficult to delimit and continually in flux.

With regards to the political scale, the Habitats Directive clearly requires favourable conservation status to be achieved at least within the EU, rather than merely within Europe or worldwide: 'conservation status of a species means the sum of the influences acting on the species . . . within . . . the European territory of the Member States to which the [EU] Treaty applies.'<sup>130</sup> Member States are individually required to take measures to maintain or restore the favourable conservation status of those species within their European territory and to report these measures to the Commission. Member States must also maintain *populations* of the species at FCS [emphasis added].<sup>131</sup> The Commission requires reporting of a species' conservation status for each biogeographical region within each Member State.<sup>132</sup> The question of at what level or scale FCS should be measured has been addressed by both natural and legal scientists. Not surprisingly, natural scientists often advocate for a greater need to consider biologically defined populations.<sup>133</sup> The legal scholar Arie

125 Charles Krebs, *Population Fluctuations in Rodents* (University of Chicago Press 2013) 4.

126 Robin Waples and Oscar Gaggiotti, 'What Is a Population? An Empirical Evaluation of Some Genetic Methods for Identifying the Number of Gene Pools and Their Degree of Connectivity' (2006) 15 *Mol Ecol* 1419, 1420. Definitions are grouped as pertaining to ecological factors, evolutionary factors or statistical factors; examples include 'a group of individuals of the same species that live together in an area of sufficient size that all requirements for reproduction, survival and migration can be met' and 'a group of individuals of the same species living close enough together than any member of the group can potentially mate with any other member'.

127 LCIE Guidelines (n 42) 17–18.

128 *ibid.*

129 *ibid.*

130 arts 1 and 2 Habitats Directive (n 1).

131 art 16(1) *ibid.*

132 2011 Guidelines (n 36) 61.

133 John Linnell and Luigi Boitani, 'Building Biological Realism into Wolf Management Policy: The Development of the Population Approach in Europe' (2012) 23 *Hystrix* 80.

Trouwborst has argued that Member States should pursue FCS both within their borders and in cooperation with neighbouring countries with which transboundary biological populations were shared.<sup>134</sup> He notes that guidance from the European Commission has been inconsistent, seeming to support the management of large carnivores at the scale of biological populations in its own guidance documents and its endorsement of the LCIE guidance documents, while on the other hand focusing only on national populations in infringement proceedings against Finland and Sweden.<sup>135</sup> Trouwborst also argues that the CJEU's small body of case law may require that FCS be achieved at the national level, pointing to the Court's reference only to the conservation status of wolves in Finland in the 2007 *Finnish Wolf* case, and not to those in Russian Karelia that are arguably part of the same population, nor to those in neighbouring Sweden and Norway.<sup>136</sup> The fact that wolves in Finland's neighbouring countries were not mentioned in the CJEU's decision is not particularly strong support for the idea that the court would refuse to consider supra-national population units, however, as Russia and Norway are not part of the EU, and, as noted earlier, the Finnish wolf's connectivity with the Scandinavian population is extremely limited. However, as Trouwborst further argues, the CJEU has consistently focused on Member States' own conservation actions and responsibilities in its decisions.<sup>137</sup> This author agrees with Trouwborst that Member States should seek to achieve FCS on both the national and biological population levels, but for an additional reason.

Multi-scalar approaches to ecosystem assessment have long been advocated by natural scientists as a means to improve accuracy and comprehension.<sup>138</sup> Others have noted the utility of assessment across 'scales of knowledge'; scales whose assessments require different types of knowledge, such as the ecological and political, for improving the relevance and credibility of results.<sup>139</sup> Achieving FCS at the European level requires thriving populations within the Member States, and across their borders. On the one hand, assessment at the population level is necessary to evaluate population dynamics and thus whether the first criterion of FCS for species is reached. However, populations are always shifting and subject to definition problems as discussed above. In contrast, terrestrial Member State boundaries within the EU are relatively stable. By requiring FCS to be achieved on multiple scales, consistent protection for species in their variety of habitats and biotopes can be achieved.

The Directive's expressed goal is ensuring biodiversity in Europe,<sup>140</sup> and seeks to achieve this goal through measures undertaken by each Member State to maintain or restore FCS for habitats and species. Each Member State has an individual obligation to contribute to the FCS of those populations within or partially within their borders.

134 Arie Trouwborst, 'Living with Success—and with Wolves: Addressing the Legal Issues Raised by the Unexpected Homecoming of a Controversial Carnivore' [2014] *EEELR* 89, 96–97.

135 Letter from Commissioner Potocnik to the Swedish Environment Minister Carlgren, 7 December 2010.

136 Case C-342/05 *Commission v Finland* (n 8) [27].

137 Case C-383/09 *Commission v France* (n 9).

138 Perhaps the most influential has been Simon Levin, 'The Problem of Pattern and Scale in Ecology' (1992) 73 *Ecology* 1943. For an analysis of scale applied to EU biodiversity legislation, see also Klaus Henle and others, *Scaling in Ecology and Biodiversity Conservation* (Advanced Books 2014).

139 Ahlborg and Nightingale (n 125).

140 art 2(1) Habitats Directive.

To this end, the Commission has required the assessment and reporting of whether a species' conservation status is favourable for each biogeographical region within a Member State. A multi-scale approach that evaluates conservation status at a population level and at a biogeographical level within each Member State, as well as at the European level, helps ensure protection.<sup>141</sup> Each Member State cannot, however, be expected to host its own population of each species with evolutionary capacity. This may be impossible or at least unreasonable in some cases, at least when it comes to far ranging species such as large carnivores. Rather, each Member State should contribute to the evolutionary capacity of the species at the European level by achieving and maintaining the demographic, ecological and genetic FCS of those species within the state in each biogeographical region in which it occurs.

As discussed above, SEPA now does use multiple scales for considering FCS.<sup>142</sup> Sweden as a political unit must host 300 wolves and one reproducing immigrant wolf per generation. The population for which genetic conservation status is evaluated is the 'greater northern European population' and includes the wolves of Scandinavia, Finland, Russia and the Baltic States.<sup>143</sup> This is despite the fact that there is no plan for cooperation in place to monitor or manage the population at this scale, and the fact that connectivity between the biological Scandinavian population and other northern European wolves is extremely limited. For Swedish wolves to be considered to be at FCS as part of this population, at a minimum the genetic health of Sweden's wolves must be reached and maintained and regular genetic exchange between Swedish wolves and the meta-population must be actual rather than hypothetical as it currently is for the most part.

### 3. CONCLUSION

This article has interrogated several contested components of FCS. It has argued that FCS may be considered to be reached even if some human management is required, but not if it is totally dependent on human management. On the other hand, if the *habitat*, rather than the *species*, requires continued human intervention, the species may also be considered at FCS if it is flourishing within that habitat. It has further argued that species must have demographic, ecological and genetic viability, as well as evolutionary capacity. Without natural and regular immigration and integration from other wolf populations, wolves in Sweden can likely never be considered to have favourable conservation status. On the other hand, not all measures that are good management practices are legally required: Member States are likely not required to increase species populations towards historical levels or carrying capacity; and though it is more logically consistent to measure FCS from carrying capacity than from extinction, Member States have discretion to do either.

Under pressure from the European Commission, the conservation status for wolves was re-evaluated in late 2015; SEPA claimed once again that it was

141 See discussion of the utility of multiscale assessments in *ibid* 4–5. See also Corrado Battisti and Giuliano Fanelli, 'Don't Think Local! Scale in Conservation, Parochialism, Dogmatic Bureaucracy and the Implementing of the European Directives' (2015) 24 *J Nat Conserv* 24, for a discussion of the need for a multiscale approach to conserving habitat under the Habitats Directive.

142 Swedish Environmental Protection Agency (n 18).

143 *ibid*.

favourable.<sup>144</sup> On the basis of SEPA's determination, licensed hunting was allowed once again in 2016.<sup>145</sup> As noted in the introduction, the 2016 hunt was injunctioned in some areas and allowed to proceed in others, and will likely continue to be a source of legal controversy.<sup>146</sup> The SEPA report is commendable for recognising the need to take into account the genetic health of the wolf population and the need for connectivity necessary for natural immigration. It is also notable that it recognises multiple scales and considers the conservation status of wolves at both a political and population level. Given the extremely low success rate of natural immigration or even relocation at this point, however, the extent to which wolves outside of Sweden and Norway can fairly be considered in determining FCS is questionable. Clearly, a record of successful immigration and improvement to genetic status must be established before the Swedish wolf's conservation status can be considered to be favourable.

The Court of Justice has thus far declined to elaborate on what constitutes FCS in its handful of species protection judgments. In an inversion of Justice Potter Stewart's famous pronouncement on obscenity,<sup>147</sup> the court knows what it is not when it does not see it (or at least has not seen the need to see it), occasionally noting various factors that lead it not to consider the conservation status of a species or population to be favourable. Unless Sweden backs down on its current position that the wolf has reached FCS, the court will likely be presented with a case in which the meaning of FCS must be more clearly addressed.<sup>148</sup> In doing so, it may help illuminate which determinations in implementing the Habitats Directive must be made by policymakers, ecologists or courts.

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144 *ibid.*

145 Swedish Environmental Protection Agency, Guidance pertaining to the licenced hunting of wolves 2016 (Vägledning gällande licensjakt efter varg 2016) (Swedish) (2015) <<https://www.naturvardsverket.se/upload/stod-i-miljoarbetet/vagledning/vilt/licensjakt/V%20c3%a4gledning%20g%20c3%a4llande%20licensjakt%20efter%20varg%202016.pdf>> accessed 26 January 2016.

146 See n 19.

147 *Jacobellis v Ohio*, 378 US 184, 197 (1964) (Justice Stewart, concurring).

148 Darpö and Epstein (n 17).