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General Secretariat

Brussels, 20 November 2025

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LIMITE

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INFORMATION

From: To:	General Secretariat of the Council Working Party on the Environment
N° prev. doc.:	ST 15686/25
Subject:	Request submitted by Gesellschaft zur Schutz der Wölfe e.V for internal review under Article 10 of Regulation (EC) 1367/2006 on the Directive (EU) 2025/1237 of the European Parliament and of the Council, of 17 June 2025, amending Council Directive 92/43/EEC as regards the protection status of wolves – Annexes 50-60

Delegations will find attached Annexes 50-60 to the request on the above-mentioned subject, as received from Gesellschaft zur Schutz der Wölfe e.V [Society for the Protection of Wolves e.V.].

10.08.2025, 18:37 Uhr

Danach ist der Biber dran ...

Brandenburg will 330 Wölfe schießen

Ein Wolf in der Brandenburger Schorfheide Foto: Photothek via Getty Images

BZ DIE STIMME BERLINS Eine Marke von Bild

Von Michael Sauerbier

Ab Herbst will Brandenburg die Wolfsjagd erlauben. Wie viele Raubtiere der Flinte zum Opfer fallen sollen, war bisher offen. Jetzt nennt der Umwelt-Staatssekretär erstmals eine Zahl. Und eine listige Jagdmethode.

In vier Wochen will Gregor Beyer (55, Ex-FDP) Nägel mit Köpfen machen. Am 11. September lädt der Staatssekretär Jagd- und Naturschutzverbände zum ersten Brandenburger Wolfsplenum seit sechs Jahren nach Potsdam. Dazu Schafzüchter, Bauern und Wolfsexperten. Beyers Ziel: „Am Ende wird es Abschuss-Quote für Wölfe geben!“

Abschuss-Quote für Wölfe geben!“

Der Ex-Förster und frühere Jagd-Lobbyist hat eine klare Vorstellung. Beyer: „Ein Drittel des Wolfsbestands muss entnommen werden. 330 Tiere sind eine realistische Größe.“ Denn der Politiker schätzt die Gesamtzahl der Wölfe im Land auf „mindestens tausend“. Und widerspricht damit seinen eigenen Experten.

Umwelt-Staatssekretär Gregor Beyer (55, FDP) will ab November die Wolfsjagd erlauben Foto: picture alliance / ZB

Brandenburgs Landesamt für Umwelt hatte letztes Jahr 58 Wolfsrudel gezählt, jedes mit durchschnittlich acht Tieren. Dazu acht Paare und zwei Einzelwölfe. Wildbiologen und Wolfsexperten bestätigten das Anfang Juli im Landtags-Ausschuss. Sie gehen von 600 bis 700 Wölfen aus. Beyer kontert: „Das

Landtags-Ausschuss. Sie gehen von 600 bis 700 Wölfen aus. Beyer kontert: „Das Zählverfahren ist lächerlich. Am Ende entscheide ich!“

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Bis November will der Staatssekretär den bisher streng geschützten Wolf zum Jagdwild erklären, dazu Jagdgesetz und Wolfsverordnung ändern. Beyer: „Dann legen wir los!“

Besondere Jagdmethode soll die richtigen Wölfe erwischen

Doch Wolfsexperten warnen: Flächendeckende Abschüsse erfahrener Wölfe, die Schafsweiden meiden, führen zu mehr Rissen von Weidetieren. Leitwölfe und Wolfsmütter mit Welpen will Beyer daher schonen.

Lesen Sie auch

600-700 leben in Brandenburg
Jäger-Chef will 500 Wölfe schießen

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Kommentiert [1]:

BZ DIE STIMME BERLINS Eine Marke von Bild

Der Staatssekretär setzt auf eine listige Jagdmethode, um die richtigen Wölfe zu erwischen. Beyer: „Wir wollen Kadaver gerissener Tiere zwei Tage liegen lassen. Und den Wolf bei der Rückkehr zum Fressen erlegen." Das befürworten auch Naturschützer, die die Wolfsjagd kritisieren.

Nur: Das ist bislang verboten. Beyer: „Wer Kadaver liegen lässt, macht sich strafbar. Aber der Landestierarzt hat zugestimmt, dass wir das in die Wolfsverordnung schreiben." Brandenburg wäre das erste Bundesland, das diese Methode erlaubt. Beyer glaubt: „An Kadavern geschossene Wölfe werden den Großteil der Abschuss-Quote ausmachen."

Ob die Jagdlist funktioniert und wie sich der Wolfsbestand dann entwickelt, will das Ministerium auswerten. „Im ersten Jahr werden wir daher zunächst eine Abschuss-Quote von 15 Prozent festlegen", sagt Beyer. Viele Wölfe werden bereits heimlich geschossen. Beyer glaubt: „Nach der Jagd-Freigabe werden die illegalen Abschüsse enden."

Nach dem Wolf ist das nächste Wildtier dran. Beyer: „2026 wollen wir auch die Biber-Verordnung ändern. Abschüsse sollen erlaubt sein, wo er Hochwasserschutz-Deiche gefährdet – oder wertvolle Bäume in geschützten Parkanlagen.“ Bislang müssen Biber mit Fallen gefangen und umgesetzt werden. Oft kehren sie aber zurück.

Jagd und Forst

Aiwanger: "Der Wolf muss endlich bejagt werden. Wir brauchen keine Verzögerungen in Berlin, sondern eine pragmatische und rechtssichere Lösung zum Schutz unserer Weidetierhalter"

06. August 2025

RUHPOLDING Bei der Hauptalmbegehung in Ruhpolding hat Bayerns Wirtschaftsminister Hubert Aiwanger ein rasches Handeln beim Wolfsmanagement gefordert. „Der Schutzstatus des Wolfes wurde von der EU endlich abgesenkt – was jetzt fehlt, ist der politische Wille schnell zu einer Bejagung zu kommen. Der Bund muss jetzt unverzüglich den günstigen Erhaltungszustand des Wolfes für ganz Deutschland an die EU melden" erklärte Aiwanger vor den rund 1000 Teilnehmern auf der Eschelmoosalm und kündigte weitere Gespräche mit der CSU an, damit der Wolf auch endlich ins Bayerische Jagdgesetz aufgenommen wird. Der Wolf könne auf Länderebene viel früher gemanagt werden wenn der Bund weiter Zeit verliert. Ein Warten auf den Bund sei weder nötig, noch verantwortbar. Der Minister forderte den Bund auf, den günstigen Erhaltungszustand für ganz Deutschland festzustellen. „Schweden kommt mit 300 Wölfen zum Ergebnis 'günstig' – in Deutschland sollen über 2.000 nicht reichen? Das ist nicht nachvollziehbar und auch den betroffenen Almwirten nicht zu vermitteln", so Aiwanger. Der bayerische Jagdminister setzt sich seit Ende 2024 für eine rechtssichere Aufnahme des Wolfs ins Bayerische Jagdgesetz ein. Sein Vorschlag sieht ein flexibles Höchstabschusssystem vor, bei dem Abschüsse regional freigegeben werden können, wenn konkrete Risse oder Gefährdungen auftreten. „Der Wolf gehört ins Jagdrecht, und zwar jetzt, nicht erst 2026", so Aiwanger.

Die Bedeutung der Almwirtschaft sei für Bayern elementar, so Aiwanger weiter. Die über 14.000 Bergbauernbetriebe pflegen rund 370.000 Hektar Bergregionen und schaffen Lebensräume für Mensch, Tier und Natur. „Die Almen sichern Biodiversität,

Kulturlandschaft und regionale Wertschöpfung – dafür verdienen unsere Almbauern höchste Anerkennung. Diese Arbeit darf nicht durch unkontrollierte Wolfspopulationen gefährdet werden“, betonte der Minister.

Ansprechpartner:
Bastian Brummer
Stellv. Pressesprecher

Pressemitteilung-Nr. 326/25

Bei der Hauptalmbegehung in Ruhpolding hat Bayerns Wirtschaftsminister Hubert Aiwanger ein rasches Handeln beim Wolfsmanagement gefordert. Foto: StMWi/Bastian Brummer

Über 14.000 Bergbauernbetriebe pflegen rund 370.000 Hektar Bergregionen in Bayern und schaffen Lebensräume für Mensch, Tier und Natur. Foto: StMWi/Bastian Brummer

Bayerns Wirtschafts- und Jagdminister hat heute an der Hauptalmbegehung in Ruhpolding teilgenommen. Foto: StMWi/Bastian Brummer

Über den Erhaltungszustand des Wolfes herrscht Uneinigkeit in den Bundesländern. Hessen ist mehr oder minder ausgebremst worden. Das zuständige Ministerium in Wiesbaden in Person des Ministers Ingmar Jung hat sich zum Thema „Erhaltungszustand“ wie folgt geäußert: „Die Bundesregierung hat nicht speziell für Hessen einen Erhaltungszustand gemeldet, sondern für die kontinentale biogeographische Region, zu der Hessen gehört. Es ist sachgerecht, dass für diese Region nicht mehr – wie bislang – von einem ungünstigen Erhaltungszustand des Wolfs ausgegangen wird. Die Entscheidung der Bundesregierung, diesen Erhaltungszustand aktuell als unbekannt zu melden, basiert auf der gemeinsamen Einschätzung von Bund und Ländern, dass die bisherigen Bewertungskriterien die dynamischen Entwicklungen der Wolfspopulation in Deutschland nicht mehr fachlich angemessen abbil-

09:00

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Neue Bewertungssystematik für den Wolf

Dieses Verfahren stößt auf Kritik, wie solche Bewertungen durchgeführt werden. Dazu sagt Minister Jung: „Vor diesem Hintergrund wurde einvernehmlich festgelegt, die Bewertungssystematik grundlegend zu überarbeiten. Ziel ist es, eine aktualisierte Methodik zu entwickeln, mit der noch im laufenden Jahr eine fachlich fundierte und realitätsnahe Bewertung des Erhaltungszustands für die kontinentale Region vorgelegt werden kann. Die Meldung unbekannt stellt einen pragmatischen und sachlich begründeten Schritt dar, um die Gesamtmeldung an die EU nicht zu verzögern und gleichzeitig die Grundlagen für ein zeitgemäßes Wolfsmanagement zu schaffen. Das Wolfsmonitoring in Hessen orientiert sich an europäischen Vorgaben und Standards. Es wurden im Berichtsjahr 2024/25 18 Individuen nachgewiesen. Unbestritten ist, dass darüber hinaus regelmäßig Durchzügler und Einzeltiere auftreten, die

Durchzügler und Einzeltiere auftreten, die nicht erfasst werden.“


09:01
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+++ Von A wie Ausrüstung bis Z wie Zecken – unsere Themenseiten +++
Frühzeitiges Wolfsmanagement
Auch wenn der Wolf keine Jagdzeit in Hessen hat, arbeitet die Landesregierung an einer Effektivitätssteigerung, um frühzeitig geeignete Mittel für ein entsprechendes Management zu schaffen. Abschließend sagt Ingmar Jung dazu: „Aufgrund der stark anwachsenden Wolfspopulation in Deutschland ist es erklärtes Ziel der Hessischen Landesregierung, bereits in einer frühen Phase der Bestandsentwicklung ein aktives Management zu etablieren. Dieses soll frühzeitig greifen, bevor die Populationsgröße ein Niveau erreicht, auf dem ein Ausgleich zwischen den berechtigten Interessen des Naturschutzes, der Landwirtschaft und des ländlichen Raums weiter erschwert wird."
LOSERT ALEXANDER | 05. AUGUST 2025 - 15:30 UHR

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VIEWPOINT OPEN ACCESS

Deeply Political and Populist Decisions on Large Carnivores in Europe in Recent Times

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In recent years, debates around downgrading the protection of large carnivores, such as wolves (*Canis lupus*) or bears (*Ursus arctos*), have become deeply political, especially in areas where these species are recovering in mainland Europe and North America (Ausband and Mech 2023; Di Bernardi et al. 2025). Various viewpoints on lethal control, either by target or non-target removals or through culling by authorities or public hunting schemes, have particularly exacerbated the polarization around large carnivore conservation and are often riddled with biased arguments (e.g., Chapron and López-Bao 2014; Kutal and Dula 2020; Vucetich and Nelson 2014). Livestock depredation is one of the main opposing factors against sharing the landscape with large carnivores. Despite inconclusive results of the effectiveness of current practices of lethal control to prevent livestock depredations (e.g., Eeden et al. 2018; Grente et al. 2024; Kutal et al. 2024), killing large carnivores is still often perceived as an effective strategy to reduce the impact of these species on livestock (Linnell et al. 2017). Lethal control is increasingly proposed as a solution by populist, center-right politicians, as seen recently across Europe (Carter and Guillot 2024).

The last decision by the Standing Committee of the Bern Convention (European Commission 2024) to downlist wolves from a "strictly protected" (Appendix II of the Bern Convention) to a "protected" (Appendix III of the Bern Convention) species, proposed by the European Commission, was entirely political and not based on scientific evidence. Even the Large Carnivore Initiative of Europe, a specialist group of IUCN's Species Survival Commission, considered the decision as "pre-mature and faulty" (LCIE 2024). However, the European Commission argued in its press release that the proposal is based on "in-depth analysis on the status of the wolf in the EU" (European Commission 2024) and stressed that "the concentration of wolf packs in some European regions has become a real danger for livestock and potentially also for humans." The Commission urged local and national authorities to "take action where necessary" (European Commission 2023), quoting the President of the European Commission from the center-right European Peoples Party.

The reasoning used by the European Commission is misleading. First, the "in-depth analysis" (Blanco and Sundseth 2023) did not actually recommend downgrading the protection status of wolves. Second, the previous study commissioned by the European Parliament on the impact of large carnivores on farmers and their livelihood (Linnell and Cretois 2018) did not provide the support for this outcome either. The current decision goes against their own recommendations from the Standing Committee of the Bern Convention on amendments of the Appendixes, which should be based on the best available science (Bern Convention 1997). In fact, a similar downlisting proposal submitted by Switzerland was opposed by the European Commission only 2 years ago (European Union 2022). There is no evidence to support a recent increase in livestock damages or threats to human safety from wolves since 2022 (Kaczensky et al. 2024). Despite the positive trend of wolf and bear populations in Europe over the last decades at the continental scale (Chapron et al. 2014;

Kaczensky et al. 2024), these species have not yet reached the so-called favorable conservation status in most European Member States (Eionet Portal 2025) as required by the European Habitats Directive, and recently confirmed by the Court of Justice of the European Union (CJEU 2024).

Wolf recolonization of European cultural landscapes containing intensive agriculture inevitably leads to more attacks on livestock, but a detailed analysis from Germany (where wolf killing is still restricted) showed that the relationship between the number of wolf territories and damage diminished over time, suggesting that non-lethal methods could reduce the losses (Singer et al. 2023). Furthermore, studies from Europe and across the world provide very limited evidence on the effectiveness of wolf killing as a useful tool to decrease livestock losses (Eeden et al. 2018; Grente et al. 2024; Kompaniyets and Evans 2017; Kutal et al. 2024; Šuba et al. 2023; Treves et al. 2016). When considering the potential danger of wolves to humans, wolf attacks on humans are extremely rare events and there have been no fatalities in Europe associated with wolves in the 21st century (Linnell et al. 2021).

However, it seems that issues of livestock and human safety around wolves have completely dominated the public debate, and quotes on the "concentration of wolf packs" have been widely reported in the media (e.g., Guillot 2024). The use of populist discourses centered on fear and emotion (Leser and Pates 2021) and the threat these species pose to rural livelihoods or human safety reinforce the use of the "political wolf" to win voters in the struggle for political power (Almarcha et al. 2022) regardless of administrative level and political ideology. Those who oppose the recovery of large carnivores or lobby for limiting their populations are positioned as defenders of the interests of particular social groups (López-Bao et al. 2017). Wolves have already been used by populist parties to symbolize the rural–urban divide (Leser and Pates 2021) and wolf attacks on livestock predicted far-right populist votes in Germany (Clemm von Hohenberg and Hager 2022). But the political wolf is not the domain of only far-right ideologies. The European Peoples Party, the largest political group in the European Parliament, also called for increased culling of wolves and bears in its manifest ahead of the last EU elections (EPP 2024). There has been a noticeable shift recently toward lowering the requirements in environmental legislation in the European Union (Durá-Alemañ and López-Bao 2025).

On March 7, 2025, the European Commission proposed to align the protection status of wolves under the EU Habitats Directive with the previous decision adopted by the Standing Committee of the Bern Convention, which was then approved by the European Parliament and the Council of the European Union on June 5, 2025 (Council of the EU 2025). In practice, this means moving all wolf populations from Annex IV (strictly protected) to Annex V (species of community interest whose taking in the wild and exploitation may be subject to management measures). This is the first time that the Annexes of the Habitats Directive have been amended. It remains to be seen whether other species will follow the wolf.

The recent political debate and incentives around large carnivore conservation at the European level, and the last decisions mentioned above, may encourage the adoption of aggressive species management approaches across Member States to cap large carnivore populations at a certain size, regardless of obligations under EU law. In Sweden, for example, licensed hunting of wolves and bears has been practiced in the last few years, even though these species have been strictly protected under the EU Habitats Directive (Annex IV), and the Swedish government has announced its intention to reduce the required minimum number of wolves in the country from 300 individuals to 170 (Ministry of Climate and Enterprise 2024). Although Member States are responsible for maintaining the favorable conservation status of species, unwarranted changes to favorable reference values could undermine previous conservation successes.

In Slovakia, wolves have already received reduced protection under EU law and were hunted for decades, but national law banned the killing of wolves since 2021 (Kutal et al. 2024). After the elections in September 2023 and the establishment of a new populist government in Slovakia, the Ministry of the Environment changed the national legislation and the Ministry of Agriculture and Rural Development issued a quota for killing 74 wolves in the last season 2024/2025 (Ministry of Agriculture and Rural Development 2024), without a robust assessment of the impact of such action on the wolf population dynamics. While official reasons for the change in the law were to prevent predation on livestock and wolf-dog hybridization, recent studies in Slovakia showed no impact of culling an average of 41 wolves per year on livestock losses in the following seasons and there was no confirmation of hybridization between wolves and domestic dogs (Hulva et al. 2018; Kutal et al. 2024; Salvatori et al. 2020). The latest legislative changes in Slovakia also simplify the process of brown bear shooting during a declared "emergency situation." As of December 2024, the Slovak authorities have already killed 93 bears in 2024 deemed to have "problematic behavior," three times more than in the previous 5 years combined (SME 2024). Furthermore, a new plan to kill 350 bears in 55 districts in Slovakia was approved in April 2025 by the Slovak government (Ministry of Environment of the Slovak Republic 2025). Romania, the country hosting the largest bear populations in continental Europe, has taken a similar turn toward lethal management in recent years (Pop et al. 2025).

The European Commission's debates and proposals to weaken wolf protection without a rigorous evaluation of the expected impacts of the proposed approach provide a foundation for national populist decisions on large carnivore management that are not evidence-based and offer little or no benefits for livestock owners, while previous proposals to improve the quality and transparency of data collection on livestock predation at the EU level (Selva et al. 2023; Singer et al. 2023) have so far been ignored. We are concerned when alleged scientific evidence is presented as a reason for the change of conservation status, but science is misused in the decision-making.

Robust, evidence-based mechanisms for managing large carnivore populations should be implemented at the national level for each EU Member State to limit the possibility that decisions will be politicized and the best available science ignored. Ultimately, each country is solely responsible for conserving biodiversity and finding sustainable ways to coexist with large carnivores. Best practices of mitigating measures for non-lethal wolf management are already available for implementation (Eeden et al. 2018; Eklund et al. 2017). Liberalizing the killing of wolves and bears

will increase not only the flexibility of management actions but also the likelihood of negative outcomes for large carnivore conservation across Europe.

Author Contributions

M.K. and J.V.L.B. designed the idea. M.K. led the writing of the manuscript. All authors reviewed and commented on the study.

Conflicts of Interest

M.K. is a member of the IUCN Large Carnivore Initiative for Europe. M.D. is a member of the IUCN Bear Specialist Group, and J.V.L.B. is a member of the IUCN Canid Specialist Group.

Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

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Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

Compliance Committee

Fifty-seventh meeting
Geneva, 27–30 June 2017
Item 9 of the provisional agenda
Communications from members of the public

Findings and recommendations of the Compliance Committee with regard to communication ACCC/C/2008/32 (part II) concerning compliance by the European Union[1]

Adopted by the Compliance Committee on 17 March 2017*

Contents

[1] The present communication originally concerned non-compliance by the European Community. As of 1 December 2009, the European Union succeeded the European Community in its obligations under the Convention (Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community). The present findings systematically refer to European Union law, institutions and bodies, even if they refer to the status before the entry into force of the Lisbon Treaty.

* This document was submitted late owing to additional time required for its finalization.

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I. Background

1. On 1 December 2008, the non-governmental organization (NGO) ClientEarth (the communicant), supported by a number of entities and a private individual,[2] submitted a communication to the Compliance Committee under the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) alleging a failure by the European Union to comply with its obligations under article 3, paragraph 1, and article 9, paragraphs 2, 3, 4 and 5, of the Convention.[3]

2. That communication is summarized in paragraphs 2 and 3, of the Committee's findings and recommendations with regard to communication ACCC/C/2008/32 (part I) concerning compliance by the European Union,[4] as adopted by the Committee at its thirty-second meeting (Geneva, 11-14 April 2011).

3. Part I of the findings focused on the communicant's main allegation, examining the jurisprudence of the Court of Justice of the European Union (CJEU) on access to justice in environmental matters generally. The Committee considered whether in the *WWF* case[5] the CJEU had accounted for the fact that the Aarhus Convention had entered into force for the Party concerned. The Committee decided not to make specific findings on whether the case in itself amounted to non-compliance with the Convention. In addition, while awaiting the outcome of the *Stichting Milieu* case[6] still pending before the CJEU, the Committee refrained from examining whether Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention to Community institutions and bodies (the Aarhus Regulation)[7] or any other relevant internal administrative review procedure of the European Union met the Convention's requirements on access to justice.

4. The Committee's findings in part I are set out in more detail in paragraphs 41-42 below.

5. On 23 July 2012, the communicant informed the Committee of the European Commission's decision to appeal the General Court's judgment of 14 June 2012 in the *Stichting Milieu* case. At its thirty-eighth meeting (Geneva, 25-28 September 2012), the Committee decided to stay its proceedings with regard to part II of the communication until the Court of Justice adopted its final ruling on the case.[8]

6. On 23 February 2015, the communicant informed the Committee that the Court of Justice had issued its judgment on the appeal proceedings in the *Stichting Milieu* case on 13 January 2015[9] and provided its comments thereon. At the Committee's invitation, the Party concerned provided observations on the communicant's comments on 11 June 2015.

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[2] See ECE/MP.PP/C.1/2011/4/Add.1, footnote 2.

[3] The communication and further correspondence and documents are available from http://www.unece.org/env/pp/compliance/Compliancecommittee/32TableEC.html.

[4] ECE/MP.PP/C.1/2011/4/Add.1.

[5] Case T-91/07, *WWF-UK Ltd v. Council of the European Union*, 2008 E.C.R. II-81; and case C-355/08, *WWF-UK Ltd v. Council of the European Union and the Commission of the European Communities*, 2009 E.C.R. I-73.

[6] Case T-338/08, *Stichting Natuur en Milieu and Pesticides Action Network Europe v. Commission*, ECLI:EU:T:2012:300.

[7] OJ L 264/13, 25.09.2006.

[8] ECE/MP.PP/C.1/2012/8, para. 11.

[9] Joined cases C-404/12 P and C-405/12 P, *Council and Commission v. Stichting Natuur en Milieu and Pesticide Action Network Europe*, ECLI:EU:C:2015:5.

7. The Committee held a hearing to discuss the substance of the communication at its forty-ninth meeting (Geneva, 30 June-3 July 2015), with the participation of representatives of the Party concerned, the communicant and observers.[10] The Committee reconfirmed the admissibility of the communication and commenced deliberations on its draft findings in closed session.

8. The Committee agreed its draft findings on part II of the communication at its fifty-third meeting (Geneva, 21-24 June 2016). In accordance with paragraph 34 of the annex to decision I/7, the draft findings were forwarded to the Party concerned and the communicant on 27 June 2016 for comments by 25 July 2016.

9. On 30 June 2016, the Party concerned requested an extension of the commenting deadline, which was granted by the Chair of the Committee on 13 September, after considering the communicant's views dated 27 July and the clarification by the Party concerned of 29 July.

10. On 17 July 2016, the communicant informed the Committee that it had no comments on the draft findings. On 18 October 2016, the Party concerned submitted its comments on the Committee's draft findings requesting, inter alia, a second hearing on part II.

11. At its fifty-fifth meeting (Geneva, 6-9 December 2016), the Committee considered the request of the Party concerned and decided that it had not put forward any grounds that justified a second hearing.

12. After taking into account the comments received, the Committee finalized its findings in closed session and adopted them through its electronic decision-making procedure on 17 March 2017. The Committee agreed that the findings should be published as a formal pre-session document for its fifty-seventh meeting.

II. Summary of facts, legal framework and issues[11]

A Legal framework

13. Paragraphs 16 to 19 of part I analyse the procedures and remedies for natural and legal persons.

14. In addition, an applicant can plead illegality under article 277 of the Treaty on the Functioning of the European Union (TFEU) (ex article 241 of the Treaty establishing the European Community) of any act of general application adopted by a European Union institution, body, office or agency.[12] Illegality under article 277 can only be invoked as an ancillary plea and is not a cause of action in its own right.

[10] Several observers also provided written statements (see http://www.unece.org/env/pp/compliance/Compliancecommittee/32TableEC.html).

[11] This section summarizes only the main facts, evidence and issues considered to be relevant to the question of compliance, as presented to and considered by the Committee.

[12] Observations by the Party concerned on the communicant's comments on the judgments by the Court of Justice, 11 June 2015, paras. 43 and 46.

B. Substantive issues

Submissions by the communicant

15. The communicant alleges there is a general failure of the Party concerned to comply with its obligations under article 9, paragraph 3, of the Convention with respect to standing of NGOs before the CJEU, claiming that the Court has avoided tackling the key legal issue: the compatibility of article 10, paragraph 1, of the Aarhus Regulation and article 9, paragraph 3, of the Convention.[13]

16. The communicant submits that it is clear from the wording of article 9, paragraph 3, that its scope is "acts and omissions" without restrictions except for decisions adopted within the legislative and judicial capacity of public authorities.

17. The communicant submits that, in contrast to article 9, paragraph 2, article 9, paragraph 3, of the Convention does not apply only to permits but to all acts and omissions. However, in limiting the possibility to resort to the internal review request procedure under article 10 of the Aarhus Regulation to acts of individual scope, the Regulation in fact limits the review procedure to permits and authorizations. Moreover, not all permits and authorizations are considered as administrative acts, but only those addressed to one operator, manufacturer or producer. As a result, very few decisions adopted in environmental matters can be challenged.[14] Therefore, according to the communicant, article 10, paragraph 1, of the Regulation does not implement article 9, paragraph 3, correctly.

18. The communicant submits that the Court could have taken another legal route and proceeded to examine the compatibility of the Regulation with the Convention, either by acknowledging that article 9, paragraph 3, of the Convention is sufficiently precise and unconditional to have direct effect[15] or by relying on different case law, such as the *Biotech* case[16] referred to by the Advocate General in his opinion.[17]

19. The communicant submits that, since part I of the Committee's findings were issued, the jurisprudence of the Court, as illustrated in the *Inuit* case,[18] has not changed its interpretation of the individual concern criterion as set out in article 263, paragraph 4, of the TFEU.[19] The Court reasserted the *Plaumann* case law,[20] which had been deemed too restrictive and barring all access to justice by the Committee in part I of its findings.[21]

[13] Communicant's comments on the judgments by the Court of Justice in cases C-401/12 P to C-405/12 P, 23 February 2015, para. 16.

[14] Ibid., para. 23.

[15] Ibid., paras. 26-27.

[16] Case C-377/98, *Kingdom of the Netherlands v. European Parliament and Council*, 2011 E.C.R. I-7079.

[17] Communicant's comments of 23 February 2015, para. 30, referring to Opinion of Advocate General Jääskinen, 8 May 2014, joined cases C-401/12 P, C-402/12 P and C-403/12 P.

[18] Case C-583/11 P, *Inuit Tapiriit Kanatami v. European Parliament and Council of the European Union*, ECLI:EU:C:2013:625, para. 72.

[19] Communicant's comments of 23 February 2015, para. 33.

[20] The Court held that: "Persons other than those to whom a decision is addressed may only claim to be individually concerned if that decision affects them by reason of certain attributes which are peculiar to them or by reason of circumstances in which they are differentiated from all other persons and by virtue of these factors distinguishes them individually just as in the case of the person addressed". See Case 25/62, *Plaumann & Co v. Commission of the European Economic Community*, 1963 E.C.R. 95.

[21] Communicant's comments of 23 February 2015, para. 34.

20. In addition, the communicant alleges that the criterion "under environmental law" in article 2, paragraph 1 (f), of the Aarhus Regulation, is not in line with article 9, paragraph 3, of the Convention as it constitutes a clear barrier to access to justice.[22]

21. Also, the communicant asserts that the "legally binding and external effects" criterion in article 2, paragraph 1 (g), of the Aarhus Regulation constitutes another barrier to the right to challenge decisions and does not have a basis in article 9, paragraph 3, of the Convention.[23]

22. The communicant alleges that article 2, paragraph 2 (d), of the Convention only excludes decisions of public authorities when acting in their legislative and judicial capacity, not in their administrative capacity. The fact that the institutions act as an administrative review body when adopting these decisions cannot justify their exemption from review.[24]

23. According to the communicant, decisions adopted by the Commission in competition matters are already subject to the Court's scrutiny. Legal or natural persons wanting to challenge them need to fulfil the criteria of "direct and individual concern" in TFEU article 263, paragraph 4, and State aid beneficiaries and their competitors have frequently been granted standing.[25] The communicant maintains that this creates an obvious discrepancy between the right of companies and member States — which have the right to challenge such decisions to protect their economic and commercial interests — and NGOs, which cannot use similar legal means to protect the environment.[26]

24. The communicant reaffirms its arguments on the internal review procedure in article 10 of the Aarhus Regulation as neither adequate, effective or fair.[27] Also, the fact that it is for the European Union institution that adopted the contested decision to decide whether it wants to review its own decision does not ensure an independent or impartial remedy. The communicant submits it is only natural that the institution will be biased and consider that all the legal and due diligence checks were made.[28]

Submissions of the Party concerned

25. The Party concerned does not agree with the communicant's allegations.

26. The Party concerned maintains that the refusal decisions by the European Commission to allow review of Decision C(2009)2560 and Commission Regulation 149/2008[29], quashed by the General Court, were re-established *ex tunc* precisely because the acts that were requested to be reviewed were considered to be of general application, and thus outside the scope of the Aarhus Regulation.[30]

27. The Party concerned stresses that the "alternative legal reasoning" evoked by the communicant arguing that the Court of Justice "could have clearly taken another legal route" disregards these judgments and cannot replace what the Court found.[31]

[22] Ibid., para. 60.
[23] Ibid., para. 69.
[24] Ibid., para. 73.
[25] Ibid., para. 77.
[26] Ibid., para. 78.
[27] Ibid., para. 82.
[28] Ibid., para. 83.
[29] OJ L 58/1, 01.03.2008.
[30] Observations by the Party concerned, 11 June 2015, para. 20.
[31] Ibid., para. 53.

28. According to the Party concerned, it did not fail to comply with article 9, paragraph 3, of the Convention, because that provision cannot be used as a parameter to assess the validity of the Aarhus Regulation. Parties to the Convention have a margin of appreciation as to how they implement article 9, paragraph 3, in their national legal orders, and the European Union institutions have exercised this margin in the context of the Aarhus Regulation.[32]

29. Concerning the implementation of article 9, paragraph 3, the Party concerned states that the European Union aligned its system; article 12 of the Aarhus Regulation gives environmental NGOs legal standing before the European Union courts to ask for review of decisions.[33]

30. In addition, the Party concerned points out that other pieces of European Union legislation contain express provisions on access to justice for members of the public (NGOs and individuals, under certain conditions) within the meaning of the Convention.[34] In this regard, the Party concerned cites a number of CJEU judgments in which the Court recognized the importance of standing for NGOs to ensure the application of European Union legislation and the conditions of standing.[35]

31. The Party concerned underlines that since the European Union has not adopted specific legislation intended to implement article 9, paragraph 3, of the Convention, it remains the responsibility of the European Union member States to implement their obligations under article 9 of the Convention, which, by virtue of TFEU article 216, is part of European Union law.[36]

32. The Party concerned also points to the *Slovak Bears* case[37] where the CJEU held that the national judge should interpret the national procedural law in the light of the Convention to the fullest extent possible and in the light of the principle of effective judicial protection.[38]

33. According to the Party concerned, natural or legal persons who are unable, because of the conditions governing admissibility laid down in TFEU article 263, paragraph 4, to challenge a regulatory act of the European Union directly before the European Union judicature are protected against the application of such an act by the ability to challenge the implementing measures which the act entails.[39] Judicial review of compliance with the European Union legal order is ensured, as can be seen from article 19, paragraph 1, of the Lisbon Treaty and from TFEU article 277, on the one hand, and TFEU article 267, on the other. The Party concerned maintains that acts of European Union institutions are subject to judicial review of their compatibility with, in particular, the treaties, the general principles of law and fundamental rights, as enshrined in the Charter of Fundamental Rights of the European Union.[40]

34. In its comments on the draft findings, the Party concerned argued that a number of the communicant's arguments on the Aarhus Regulation were inadmissible. It submitted that the Committee's recommendations ignored the specific features of the European Union

[32] Ibid., para. 21.
[33] Ibid., para. 24.
[34] Ibid,, paras. 25-30, where the Party concerned cites a body of European Union legislation.
[35] Ibid., para. 32.
[36] Ibid., para. 26.
[37] C-240/09, *Lesoochranárske zoskupenie*, 2011 E.C.R. I-1255.
[38] Ibid., para. 52.
[39] Ibid., para. 42, citing case C-456/13 P, *T & L Sugars Ltd and Sidul Acucares v. Commission*, ECLI:EU:C:2015:284.
[40] Ibid., para. 51.

framework and that it was for the CJEU itself to develop its jurisprudence, which constitutes a continuous process. The Party concerned also complained that the Committee took up a number of arguments introduced by the communicant after February 2015. It submitted that the Committee should not be used for an abstract discussion and that the communicant should have exhausted internal remedies before addressing the Committee, and pointed out that the Committee itself has expressly declared that an *actio popularis* is not what the Convention requires.

35. The Party concerned added that the Aarhus Regulation is not the only means by which the European Union gives effect to the Aarhus Convention and the European Union legal order covers remedies available to individuals through other means. It also argued that the judgment of the Court of Justice in *Stichting Milieu* had to be accepted.

36. The Party concerned also challenged the Committee's draft findings on provisions of the Aarhus Regulation, including those relating to the meaning of "individual scope", "under environmental law", "not having legally binding and external effects" and "measures taken or omissions by a community institution or body in its capacity as an administrative review body". The Party concerned also challenged the draft finding on the effectiveness of the internal review procedure and the scope of judicial review.

37. The communicant responded that the specific features of the European Union legal framework do not allow the Party concerned to ignore the obligations flowing from ratification of the Convention, and that the list of preliminary reference procedures provided by the Party concerned is irrelevant to part II of the findings because they do not compensate for the lack of standing before the European Union courts. The communicant also disagreed with a number of points made by the Party concerned with respect to the Aarhus Regulation.

III. Consideration and evaluation by the Committee

A. Legal basis and scope of considerations of the Committee

38. The European Union signed the Convention on 25 June 1998 and approved it through Council Decision 2005/370/EC of 17 February 2005.[41] The European Union has been a Party to the Convention since 17 May 2005.[42]

The Committee and the CJEU

39. The Committee's role is to review compliance by Parties with their obligations under the Convention.[43] To this end, it may examine compliance issues and make recommendations if and as appropriate.[44] The Committee reports on its activities at each ordinary meeting of the Parties.[45] The Meeting of the Parties may then, upon consideration of the Committee's report and any recommendations, decide upon appropriate measures to bring about full compliance with the Convention.[46] It is, however, for the Parties themselves to implement the obligations under the Convention within their own legal systems.

[41] OJ L 124, 17 May 2005, pp. 1–3.
[42] See part I, paras. 57 and 58.
[43] Decision I/7, annex, para. 1.
[44] Ibid., para. 14.
[45] Ibid., para. 35.
[46] Ibid., para. 37.

40. The CJEU is an institution of the Party concerned and as such is subject to the Committee's review. Here, the Committee considers the effect of the CJEU jurisprudence on the obligations of the European Union arising under the Convention at the time these findings are adopted, without speculating about future changes in that jurisprudence, and without challenging the unquestioned right of the CJEU, as for the courts of any Party, to develop its own jurisprudence, provided it meets the requirements of the Convention.

Scope of the Committee's considerations

41. Part II must be read alongside part I; the two parts form the whole of the Committee's findings on communication ACCC/C/2008/32. While part I must be read in its entirety, the following findings from part I are particularly important for the purposes of understanding this part:

> For at least some acts and omissions by [European Union (EU)] institutions, the Party concerned must ensure that members of the public have access to administrative or judicial review procedures, as set out in article 9, paragraph 3.[47]
>
> The cases referred to by the communicant [in part I] reveal that, to be individually concerned, according to the [European Court of Justice (ECJ)], the legal situation of the person must be affected because of a factual situation that differentiates him or her from all other persons. Thus, persons cannot be individually concerned if the decision or regulation takes effect by virtue of an objective legal or factual situation.[48]
>
> The jurisprudence established by the ECJ [and examined in part I] is too strict to meet the criteria of the Convention.[49]
>
> If the examined jurisprudence of the EU Courts on access to justice were to continue, unless fully compensated for by adequate administrative review procedures, the Party concerned would fail to comply with article 9, paragraph 3, of the Convention.[50]
>
> While the system of judicial review in the national courts of the EU member States, including the possibility to request a preliminary ruling, is a significant element for ensuring consistent application and proper implementation of EU law in its member States, it cannot be a basis for generally denying members of the public access to the EU Courts to challenge decisions, acts and omissions by EU institutions and bodies.[51]
>
> The Committee refrains from any speculation on whether and how the EU Courts will consider the jurisprudence on access to justice in environmental matters on the basis of [article 263, paragraph 4, of] the TFEU.[52]
>
> If the jurisprudence of the EU Courts examined in [part I] were to continue, unless fully compensated for by adequate administrative review procedures, the Party concerned would … fail to comply with article 9, paragraph 4, of the Convention.[53]

[47] Part I, para. 74.
[48] Ibid., para. 86.
[49] Ibid., para. 87.
[50] Ibid., para. 88.
[51] Ibid., para. 90.
[52] Ibid., para. 91.
[53] Ibid., para. 92.

> The allegations concerning costs were not sufficiently substantiated by the communicant.[54]

42. The recommendations in part I were as follows:

> 97. While the Committee is not convinced that the Party concerned fails to comply with the Convention, given the evidence before it, it considers that a new direction of the jurisprudence of the EU Courts should be established in order to ensure compliance with the Convention.
>
> 98. Therefore, the Committee, pursuant to paragraph 36 (b) of the annex to decision I/7, recommends to the Party concerned that all relevant EU institutions within their competences take the steps to overcome the shortcomings reflected in the jurisprudence of the EU Courts in providing the public concerned with access to justice in environmental matters.[55]

43. It follows from paragraph 97 of Part I that, in order to examine whether the Party concerned is in compliance with article 9, paragraphs 3 and 4, of the Convention, the Committee's first task in part II of its findings is to consider whether there is a new direction in the jurisprudence of the European Union courts. Secondly, the Committee needs to consider whether any other steps have been taken to overcome or compensate for the shortcomings reflected in that jurisprudence.

44. In this context, the Committee notes the comment of the Party concerned that "the development of CJEU jurisprudence relating to the Aarhus Convention is a continuous process".[56] The Committee emphasizes that this is not an accepted reason for not complying with the Convention. All Parties to the Convention are required to implement the Convention from the date it enters into force for them.

45. In considering the two issues outlined in paragraph 43 above, the Committee will not assess in detail every possible form of challengeable decision-making by European Union institutions, nor each decision by the European Union courts referred to by the communicant and the Party concerned. Nor will the Committee consider all applicable European Union law that purports to implement the Convention. Instead the Committee will focus on the most important allegations of the communicant,[57] and examine first the most important trends in the jurisprudence of the European Union courts on access to justice in environmental matters since the adoption of part I of its findings. After that, the Committee will consider the effect of the Aarhus Regulation.

B Substantive issues

Jurisprudence of the CJEU: *Stichting Milieu*

The significance of Stichting Milieu

46. In part I, the Committee refrained from examining whether the Aarhus Regulation or any other relevant internal administrative review procedure of the European Union met the requirements on access to justice in the Convention because it was waiting for the outcome of the *Stichting Milieu* case.[58]

[54] Ibid., para. 93.
[55] Ibid.
[56] Comments of the Party concerned on the draft findings, para. 31.
[57] The Committee took a similar approach in part I (see part I, para. 63).
[58] Part I, para. 10.

47. The Committee instead considered and evaluated the established practice of the European Union courts in the light of the Convention's provisions on access to justice; this was on the basis that even if the European Union jurisprudence initiated before the entry into force of the Convention was not consistent with the Convention, that would not lead to the conclusion that the Party concerned was in non-compliance, although it might reveal that the Party concerned would be in non-compliance if the jurisprudence remained the same.[59]

48. The Committee therefore now considers the Court of Justice's judgment in *Stichting Milieu* to determine whether it represents a change in the direction of its jurisprudence, and in particular whether it brings the European Union into compliance with the Convention.

The Stichting Milieu case

49. In *Stichting Milieu*, the General Court considered the effect of article 9, paragraph 3, of the Convention and whether article 10, paragraph 1, of the Aarhus Regulation implemented the Convention. The Court considered it appropriate to examine the validity of article 10, paragraph 1, of the Aarhus Regulation in the light of the Convention. The Court held:

> 72. The term 'acts', as used in Article 9(3) of the Aarhus Convention, is not defined in that convention. According to well-established case-law, an international treaty must be construed by reference to the terms in which it is framed and in the light of its objectives. ...
>
> 73. It is appropriate first of all to recall the objectives of the Aarhus Convention.
> ...
>
> ...
>
> 76. It must be held that an internal review procedure which covered only measures of individual scope would be very limited, since acts adopted in the field of the environment are mostly acts of general application. In the light of the objectives and purpose of the Aarhus Convention, such limitation is not justified.
>
> 77. Also, as regards the terms in which Article 9(3) of the Aarhus Convention is framed, it should be noted that, under those terms, the Parties to that Convention retain a certain measure of discretion with regard to the definition of the persons who have a right of recourse to administrative or judicial procedures and as to the nature of the procedures (whether administrative or judicial). Under Article 9(3) of the Aarhus Convention, only 'where they meet the criteria, if any, laid down in [the] national law, [may] members of the public have access to administrative or judicial procedures'. However, the terms of Article 9(3) of the Aarhus Convention do not offer the same discretion as regards the definition of the 'acts' which are open to challenge. Accordingly, there is no reason to construe the concept of 'acts' in Article 9(3) of the Aarhus Convention as covering only acts of individual scope.
>
> 78. Lastly, so far as the wording of the other provisions of the Aarhus Convention is concerned, it should be noted that, under Article 2(2) of that convention, the concept of 'public authority' does not cover 'bodies or institutions acting in a judicial or legislative capacity'. Accordingly, the possibility that measures adopted by an institution or body of the European Union acting in a judicial or legislative capacity may be covered by the term 'acts', as used in Article 9(3) of the Aarhus Convention, can be ruled out. That does not mean, however, that

[59] Ibid., para. 64.

> the term ‘acts’ as used in Article 9(3) of the Aarhus Convention can be limited to measures of individual scope. There is no correlation between measures of general application and measures taken by a public authority acting in a judicial or legislative capacity. Measures of general application are not necessarily measures taken by a public authority acting in a judicial or legislative capacity.
>
> 79. It follows that Article 9(3) of the Aarhus Convention cannot be construed as referring only to measures of individual scope.
>
> 80. That finding is not undermined by the argument, raised by the Council at the hearing, that limiting ‘administrative acts’ to measures of individual scope is justified in the light of the conditions laid down in Article 230 EC. In that regard, it should be noted that, under Article 12(1) of Regulation No 1367/2006, a non-governmental organisation which has made a request for internal review pursuant to Article 10 of Regulation No 1367/2006 may institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty, hence in accordance with Article 230 EC. However, whatever the scope of the measure covered by an internal review as provided for in Article 10 of Regulation No 1367/2006, the conditions for admissibility laid down in Article 230 EC must always be satisfied if an action is brought before the Courts of the European Union.
>
> 81. Moreover, the conditions laid down in Article 230 EC — and, in particular, the condition that the contested act must be of direct and individual concern to the applicant — apply also to measures of individual scope which are not addressed to the applicant. A measure of individual scope will not necessarily be of direct and individual concern to a non-governmental organisation which meets the conditions laid down in Article 11 of Regulation No 1367/2006. Contrary to the assertions made by the Council, limiting the concept of ‘acts’ exclusively to measures of individual scope does not ensure that the condition laid down in Article 230 EC — that the contested act must be of direct and individual concern to the applicant — will be satisfied.
>
> 82. Accordingly, the Council’s argument that limiting ‘administrative acts’ to measures of individual scope is justified in the light of the conditions laid down in Article 230 EC must be rejected.
>
> 83. It follows from the above that Article 9(3) of the Aarhus Convention cannot be construed as referring exclusively to measures of individual scope. Consequently, in so far as Article 10(1) of Regulation No 1367/2006 limits the concept of ‘acts’, as used in Article 9(3) of the Aarhus Convention, to ‘administrative act[s]’ defined in Article 2(1)(g) of Regulation No 1367/2006 as ‘measure[s] of individual scope’, it is not compatible with Article 9(3) of the Aarhus Convention.[60]

50. The Committee agrees with the above paragraphs of the General Court’s judgment, both as to the effect of article 9, paragraph 3, of the Convention and the failure of article 10, paragraph 1, of the Aarhus Regulation to implement article 9, paragraph 3.

51. In particular, the Committee agrees with the General Court’s analysis that “there is no reason to construe the concept of ‘acts’ in article 9, paragraph 3, of the Convention as covering only acts of individual scope” and that “there is no correlation between measures of general application and measures taken by a public authority acting in a judicial or legislative capacity”. It follows that article 10, paragraph 1, of the Aarhus Regulation fails

[60] Case T-338/08, *Stichting Milieu*.

to correctly implement article 9, paragraph 3, of the Convention insofar as the former covers only acts of individual scope.

52. It is also important to note that while article 9, paragraph 3, allows Parties a degree of discretion to provide criteria that must be met by members of the public before they have access to justice,[61] it does not allow Parties any discretion as to the acts or omissions that may be excluded from implementing laws.

53. The Council of the European Union and the European Commission appealed the General Court's judgment, asking the Court of Justice to set the judgment aside. The Court of Justice neither agreed nor disagreed with the General Court's reasoning in the paragraphs quoted above. Rather, the Court of Justice found:

> 52. … it cannot be considered that, by adopting Regulation No 1367/2006, which concerns only EU institutions and moreover concerns only one of the remedies available to individuals for ensuring compliance with EU environmental law, the European Union was intended to implement the obligations, within the meaning of the case-law cited in paragraph 48 of this judgment, which derive from Article 9(3) of the Aarhus Convention with respect to national administrative or judicial procedures, which, as EU law now stands, fall primarily within the scope of Member State law (see, to that effect, judgment in *Lesoochranárske zoskupenie*, EU:C:2011:125, paragraphs 41 and 47).
>
> 53. It follows from all the foregoing that, in holding that Article 9(3) of the Aarhus Convention could be relied on in order to assess the legality of Article 10(1) of Regulation No 1367/2006, the General Court vitiated its judgment by an error of law.
>
> 54. Accordingly, the judgment under appeal must be set aside, and there is no need to examine the other grounds put forward by the Council and the Commission in support of their appeals.[62]

54. While surprised by the above reasoning, the Committee acknowledges the ruling of the Court of Justice as an interpretation of European Union law. However, by setting aside the judgment of the General Court in this way, the Court left itself unable to mitigate the flaws correctly identified by the General Court. So it remains the case that article 9, paragraph 3, of the Convention is not adequately implemented by article 10, paragraph 1, of the Aarhus Regulation.

55. It follows that the Court of Justice's judgment in *Stichting Milieu* does not bring the Party concerned into compliance with article 9, paragraph 3, and, consequently, article 9, paragraph 4, of the Convention. The Committee will next examine other European Union jurisprudence since part I was adopted to see whether it nevertheless brings the Party concerned into compliance.

Jurisprudence referred to by the Party concerned regarding national implementation

56. At the hearing, the Party concerned drew the Committee's attention to a number of judgments by the European Union courts.[63] While that jurisprudence showed that the

[61] See findings on communication ACCC/C/2005/11 (Belgium) (ECE/MP.PP/C.1/2006/4/Add.2), para. 35.

[62] Joined cases C-401/12 P, C-402/12 P and C-403/12 P, *Stichting Milieu*.

[63] Case C-240/09*, Lesoochranárske zoskupenie VLK v. Ministerstvo životného prostredia Slovenskej republiky*, E.C.R. 2011 I-1255; case C-115/09, *Bund für Umwelt und Naturschutz Deutschland, Landesverband Nordrhein-Westfalen v. Bezirksregierung Arnsberg*, E.C.R. 2011 I-3673; joined cases

obligations arising under the Convention for the European Union and its member States were given due weight on a number of occasions, none of the cases addressed the shortcomings identified in part I. Moreover, the subject matter of much of the jurisprudence cited concerned the enforcement of the Convention in national courts. While it is salutary to learn of the Convention's enforcement at the national level, the Committee already observed in part I that:

> While the system of judicial review in the national courts of the EU member States, including the possibility to request a preliminary ruling, is a significant element for ensuring consistent application and proper implementation of EU law in its member States, it cannot be a basis for generally denying members of the public access to the EU Courts to challenge decisions, acts and omissions by EU institutions and bodies; nor does the system of preliminary review amount to an appellate system with regard to decisions, acts and omissions by the EU institutions and bodies. Thus, with respect to decisions, acts and omissions of EU institutions and bodies, the system of preliminary ruling neither in itself meets the requirements of access to justice in article 9 of the Convention, nor compensates for the strict jurisprudence of the EU Courts, examined … above.[64]

57. The Committee reiterates its above finding that judicial review in the national courts of European Union member States cannot compensate for the strict jurisprudence of the European Union courts examined in part I, and notes that the CJEU itself has held that the system of preliminary ruling does not constitute a means of redress available to the parties to a case pending before a national court or tribunal.[65]

Jurisprudence on Article 263, paragraph 4, of the TFEU

58. In part I, the Committee noted that there was a debate on whether the new article 263, paragraph 4, of the TFEU provided for a possible change of jurisprudence so as to enable members of the public to have standing before the European Union courts.

59. The jurisprudence examined in part I related to the text of (now superseded) article 230, paragraph 4, of the Treaty establishing the European Community. In part I, the Committee noted that the wording of TFEU article 263, paragraph 4, introduced by the Lisbon Treaty and which superseded article 230, paragraph 4, of the Treaty establishing the European Community, is different and could lead to a change of jurisprudence so as to enable members of the public to have standing before the European Union courts. The Committee considered whether TFEU article 263, paragraph 4, could provide the basis for ensuring compliance with article 9 of the Convention. It refrained, however, from speculation on whether and how the European Union courts would consider the jurisprudence on access to justice in environmental matters on the basis of the TFEU.[66]

60. The Committee now considers whether, in the years that have passed since part I was adopted, there has been any sign that, in the light of the jurisprudence of the European

C-128/09 to C-131/09, C-134/09 and C-135/09, *Boxus v. Région wallonne*, 2011 E.C.R. I-9711; case C-182/10, *Solvay v. Région wallonne*, ECLI:EU:C:2012:82; case C-416/10, *Krizan v. Slovenská inšpekcia životného prostredia*, ECLI:EU:C:2013:8; case C-260/11, *Edwards and Pallikaropoulos v. Environment Agency*, ECLI:EU:C:2013:221; case C-72/12, *Gemeinde Altrip v. Land Rheinland-Pfalz*, ECLI:EU:C:2013:712; case C-404/13, *ClientEarth v. the Secretary of State for the Environment, Food and Rural Affairs*, ECLI:EU:C:2014:2382.

[64] Part I, para. 90.

[65] Case 283/81, *CILFIT v. Ministero della Sanità*, 1982 E.C.R. 3415.

[66] Part I, para. 91.

Union courts, TFEU article 263, paragraph 4, ensures compliance with article 9 of the Convention.

61. Article 263, paragraph 4, of the TFEU provides:

> Any natural or legal person may, under the conditions laid down in the first and second paragraphs, institute proceedings against an act addressed to that person or which is of direct and individual concern to them, and against a regulatory act which is of direct concern to them and does not entail implementing measures.

62. The provision has three alternative limbs:

> (a) "Any natural or legal person may … institute proceedings against an act addressed to that person";
>
> (b) "Any natural or legal person may … institute proceedings against an act … which is of direct and individual concern to them";
>
> (c) "Any natural or legal person may … institute proceedings … against a regulatory act which is of direct concern to them and does not entail implementing measures."

63. The first limb is unchanged by the Treaty of Lisbon, and needs no consideration by the Committee because it patently does not implement article 9, paragraph 3, of the Convention.

64. The second limb is little changed by the Treaty of Lisbon and may in any event be quickly dispatched for the purposes of this analysis. Under this limb, a person may only institute proceedings against an act which is of "direct and individual concern to them". It follows from the Committee's findings in part I, which considered the jurisprudence relating to direct and individual concern, that the second limb does not implement article 9, paragraph 3, of the Convention because the restrictions to access to justice imposed by the "direct and individual concern" test are too severe to comply with the Convention.

65. That leaves the third limb. This limb has been considered in the *Inuit* case and the *Microban* case.[67]

66. To assess whether the third limb implements article 9, paragraph 3, it is necessary to consider the meanings of "regulatory act", "of direct concern" and "does not entail implementing measures" in European Union jurisprudence.

67. Before addressing those definitions, the Committee notes that the third limb does not require a person to be individually concerned with a regulatory act. By dropping the individual concern test, the third limb pursues an objective of opening up the conditions for bringing direct actions.[68]

Regulatory act

68. In the *Inuit* case, the CJEU found that the third limb of TFEU article 263, paragraph 4, enabled persons to bring "actions for annulment of acts of general application other than legislative acts". So the Court's interpretation of "regulatory act" is quite narrow in scope.

69. Article 9, paragraph 3, of the Convention requires Parties to give members of the public access to administrative or judicial procedures to challenge "acts and omissions by

[67] Case T-262/10, *Microban International Ltd v Commission*, 2011 E.C.R. II-7697.

[68] See, e.g., *Microban* case, para. 32; *Inuit* case, para. 35.

private persons and public authorities which contravene provisions of its national law relating to the environment". It is clear that at least some acts and failures to act susceptible to judicial review under article 9, paragraph 3, of the Convention will not fall within the category of "acts of general application other than legislative acts". So in the light of the reasoning of the CJEU, the third limb would be too narrow in scope to bring the Party concerned into compliance with article 9, paragraph 3, of the Convention.

70. In any event, the third limb of article 263, paragraph 4, raises other issues for the Committee, as considered below.

Of direct concern

71. The *Microban* case explains the "direct concern" condition in Article 263, paragraph 4, thus:

> 27. ... as regards the condition of direct concern as laid down in the fourth paragraph of Article 230 EC, it has been held that that condition required that, firstly, the contested Community measure must directly affect the legal situation of the individual and, secondly, it must leave no discretion to its addressees, who are entrusted with the task of implementing it, such implementation being purely automatic and resulting from Community rules without the application of other intermediate rules ...

72. The *Microban* case provides a practical example of an organization that met the "direct concern" condition. In that case the applicants, who were found to be directly concerned by a particular measure, bought a particular substance regulated by the measure concerned and used it to manufacture a product with particular properties, which was subsequently sold on for use in manufacture. Thus by being economically affected they were considered by the Court to be directly concerned.

73. It follows from the *Microban* case and the case law referred to therein that an NGO promoting environmental protection would not be directly concerned with a contested measure unless the measure in question directly affected the organization's legal position. Such an organization would always be excluded from instituting proceedings under the third limb of article 263, paragraph 4, when it acted purely for the purposes of promoting environmental protection. The Committee considers that while Parties have a margin of discretion when establishing criteria for the purposes of article 9, paragraph 3, of the Convention, that margin of discretion does not allow them to exclude all NGOs acting solely for the purposes of promoting environmental protection from redress.[69]

74. It follows that the direct concern criterion alone prevents article 263, paragraph 4, from implementing article 9, paragraph 3, of the Convention. But even if this were not the case, the final criterion in the third limb would be problematic.

Does not entail implementing measures

75. In the *Microban* case, the Court reiterated that an act within the scope of the third limb of article 263, paragraph 4, must leave no discretion to its addressees, who are entrusted with the task of implementing it, such implementation being purely automatic and resulting from Community rules without the application of other intermediate rules.

[69] See findings on communication ACCC/C/2005/11 (Belgium) (ECE/MP.PP/C.1/2006/4/Add.2), para. 35.

76. It is clear to the Committee that at least some acts that should be susceptible to administrative or judicial review under article 9, paragraph 3, of the Convention would not meet this criterion.

77. It follows that the third limb of TFEU article 263, paragraph 4, as applied by the European courts, does not implement article 9, paragraph 3, of the Convention; there is no basis in the Convention for excluding from the scope of this provision acts which include implementing measures.

78. The Committee reiterates that, while article 9, paragraph 3, allows Parties a degree of discretion to provide criteria that must be met by members of the public before they have access to justice, it does not allow Parties any discretion as to the acts or omissions that may be excluded from implementing laws (see para. 52 above).

Concluding remarks on jurisprudence

79. Having considered the main jurisprudence of the European Union courts since part I of these findings was adopted, the Committee finds that there has been no new direction in the jurisprudence of the CJEU that will ensure compliance with article 9, paragraph 3, and consequentially, article 9, paragraph 4, of the Convention.

80. In this regard, the Committee notes that in the *Slovak Bears* case, the CJEU made the following findings:

> 49. … if the effective protection of EU environmental law is not to be undermined, it is inconceivable that Article 9(3) of the Aarhus Convention be interpreted in such a way as to make it in practice impossible or excessively difficult to exercise rights conferred by EU law.
>
> 50. It follows that … it is for the national court, in order to ensure effective judicial protection in the fields covered by EU environmental law, to interpret its national law in a way which, to the fullest extent possible, is consistent with the objectives laid down in Article 9(3) of the Aarhus Convention.

81. The Committee regrets that, despite its finding with respect to the national courts, the CJEU does not consider itself bound by this principle. If the European Union courts had been bound in the same way as the national courts, the European Union might have moved towards compliance with article 9, paragraph 3, and consequently article 9, paragraph 4.

82. In addition, according to the current jurisprudence, the European Union courts may not assess whether key provisions in the Aarhus Regulation implement or comply with article 9, paragraph 3. So the Committee must assess whether the provisions of the Aarhus Regulation are consistent with the Convention. If, however, the European Union courts had allowed themselves to rely on article 9, paragraph 3, of the Convention to assess the legality of article 10, paragraph 1, of the Aarhus Regulation that could have assisted the Party concerned to comply with its obligations under the Convention.

The Aarhus Regulation: introduction

83. It now falls to the Committee to consider whether the Aarhus Regulation compensates for the shortcomings in European Union law that have been identified in the above discussion of the jurisprudence by introducing adequate review procedures. In part I the Committee did not examine the Aarhus Regulation, although it indicated that an examination of the Regulation would be forthcoming.[70]

[70] Part I, para. 88.

84. The Party concerned contends that a number of the communicant's arguments relating to the Aarhus Regulation and introduced in its comments of 23 February 2015 are inadmissible and should not have been introduced at that late stage.[71]

85. But it is essential to consider the effect of the Aarhus Regulation in order to determine whether the Party concerned complies with article 9, paragraphs 3 and 4, of the Convention because the Regulation may provide access to justice where the jurisprudence of the CJEU fails to do so. It is thus not possible to make a finding in this case without considering the Regulation. That is why the Committee, in its letter of 19 June 2015, expressly asked the Party concerned and the communicant to address in their statements for the hearing on 1 July 2015 the question: "Does the Aarhus Regulation meet the requirements on access to justice in the Convention?" Therefore the comments from the Party concerned are not valid.

86. Moreover, this case was divided into two parts in order to defer consideration of those elements for which it made sense to await the outcome of the *Stichting Milieu* case. It was always envisaged that the Committee would consider new developments and arguments after that case and the Committee is ready to do so.

87. Article 10, paragraph 1, of the Aarhus Regulation provides that:

> Any non-governmental organisation which meets the criteria set out in Article 11 is entitled to make a request for internal review to the Community institution or body that has adopted an administrative act under environmental law or, in case of an alleged administrative omission, should have adopted such an act.

88. In their update on the Court of Justice's rulings in cases C-401/12 P to C- 405/12 P dated 23 February 2015, the communicants complained that the Aarhus Regulation failed to implement article 9, paragraph 3, of the Convention in five particular areas: acts of individual scope;[72] acts not adopted under environmental law;[73] acts not having legally binding and external effects;[74] arbitrary exemptions to the administrative acts definition;[75] and the adequacy and effectiveness of the internal review procedure.[76]

90. In order to focus on the communicant's main allegations, the Committee will consider those principal complaints, rather than forensically examining every one of the alleged flaws in the Regulation. While for the most part the Committee considers whether the Regulation itself amounts to satisfactory implementation of the obligations of the Party concerned, it also takes into account any jurisprudence regarding the relevant provisions. The Party concerned is required by article 3, paragraph 1, of the Convention to take the necessary legislative, regulatory and other measures to establish and maintain a clear, transparent and consistent framework to implement the Convention, so any flaw in the Regulation may in itself amount to non-compliance.

91. The Committee will first briefly consider the communicant's further allegation that the Aarhus Regulation fails to grant to individuals or entities other than NGOs, such as regional and municipal authorities, access to internal review.[77] The Party concerned is not required to establish an *actio popularis*, but the current jurisprudence of the European Union does not provide access to justice in accordance with article 9, paragraph 3.

[71] Comments of the Party concerned on the draft findings.
[72] Communicant's comments of 23 February 2015, paras. 42-49.
[73] Ibid., paras. 50-60.
[74] Ibid., paras. 61-71.
[75] Ibid., paras. 72-81.
[76] Ibid., paras. 82-84.
[77] Communication, p. 3.

Entities other than NGOs

92. It is clear that article 10, paragraph 1, of the Aarhus Regulation only entitles NGOs that meet particular criteria to make a request for an internal review; yet article 9, paragraph 3, requires "members of the public" that meet the criteria, if any, laid down in the law, to be given access to administrative or judicial procedures.

93. The Committee notes that article 9, paragraph 3, may not be used to effectively bar almost all members of the public from challenging acts and omissions.[78] The term "members of the public" in the Convention includes, but is not limited to, NGOs. It follows that, by barring all members of the public except NGOs meeting the criteria of its article 11, the Aarhus Regulation fails to correctly implement article 9, paragraph 3.

Acts of individual scope

94. As the Committee has already found in paragraph 51 above, article 10, paragraph 1, of the Aarhus Regulation fails correctly to implement article 9, paragraph 3, of the Convention because the former provision covers only acts of individual scope.

Acts not adopted under environmental law

95. Under article 2, paragraph 1 (g), of the Aarhus Regulation:

> "Administrative act" means any measure of individual scope under environmental law, taken by a Community institution or body, and having legally binding and external effects.

96. Under article 2, paragraph 1 (f):

> "Environmental law" means Community legislation which, irrespective of its legal basis, contributes to the pursuit of the objectives of Community policy on the environment as set out in the Treaty: preserving, protecting and improving the quality of the environment, protecting human health, the prudent and rational utilisation of natural resources, and promoting measures at international level to deal with regional or worldwide environmental problems.

97. The combined effect of these provisions is too narrow.

98. Article 9, paragraph 3, of the Convention requires Parties to ensure members of the public have access to administrative or judicial procedures to challenge acts and omissions by private persons and public authorities which "contravene" provisions of its national law relating to the environment.

99. This is not implemented by the Aarhus Regulation, which simply provides for internal review where a Community institution or body has "adopted an act under" environmental law. But article 9, paragraph 3, is broader than that; its requirement is to provide a right of challenge where an act or omission — any act or omission whatsoever by a Community institution or body, including any act implementing any policy or any act under any law — contravenes law relating to the environment.

100. It is clear that, under the Convention, an act may "contravene" laws relating to the environment without being "adopted" under environmental law within the meaning of article 10, paragraph 1, of the Regulation. So it is not consistent with article 9, paragraph 3, of the Convention to exclude from the scope of article 10, paragraph 1, any act or omission

[78] See findings on communication ACCC/C/2006/18 (Denmark) (ECE/MP.PP/2008/5/Add.4), paras. 30-31).

made under European Union legislation which does not "contribute to the pursuit of the objectives of Community policy on the environment as set out in the Treaty".[79] Depending on the circumstances, such an act or omission may contravene a law relating to the environment. The correct test is not whether an act is adopted under law of any description.

Acts not having legally binding and external effects

101. While article 9, paragraph 3, allows Parties a degree of discretion to provide criteria that must be met by members of the public before they have access to justice, it does not allow Parties any discretion as to the acts that may be excluded from implementing laws.

102. The communicant complains that article 2, paragraph 1 (g), of the Aarhus Regulation requires a measure to have "legally binding and external effects" before that measure falls within the definition of "administrative act", and thus within the scope of article 10, paragraph 1. The communicant gives evidence that on a number of occasions administrative review of an act has been refused because of this requirement[80] and argues that the "legally binding and external effect" criterion constitutes another barrier to the right to challenge decisions and does not have a basis in article 9, paragraph 3, of the Convention.

103. The Aarhus Regulation does not provide much explanation for the use of this criterion. While recital (11) is related to the issue, it simply contains the following bald assertion: "Administrative acts of individual scope should be open to possible internal review where they have legally binding and external effects." In this context the reasoning used by the Committee to find that the "individual scope" criterion is invalid (see para. 51 above) applies by analogy. The Committee is not convinced that generally excluding all acts that do not have legally binding and external effects is compatible with article 9, paragraph 3, of the Convention. It appears that some acts by the Party concerned that do not have legally binding or external effect, including some or all of those referred to by the communicant,[81] might be covered by article 9, paragraph 3.

104. It follows that article 10, paragraph 1, of the Aarhus Regulation fails to implement article 9, paragraph 3, of the Convention insofar as it covers only administrative acts, or omissions to adopt such acts, that have legally binding and external effects.

The exemption of administrative review

105. Article 2, paragraph 2, of the Aarhus Regulation provides:

> Administrative acts and administrative omissions shall not include measures taken or omissions by a Community institution or body in its capacity as an administrative review body, such as under:
>
> (a) Articles 81, 82, 86 and 87 of the Treaty (competition rules);
>
> (b) Articles 226 and 228 of the Treaty (infringement proceedings);
>
> (c) Article 195 of the Treaty (Ombudsman proceedings);
>
> (d) Article 280 of the Treaty (OLAF proceedings).

106. It is important to note that the list of provisions in article 2, paragraph 2 (a) to (d), of the Regulation do not amount to an exhaustive list of measures taken in the capacity of a

[79] See definition of "environmental law" in article 2, para. 2 (f), of the Aarhus Regulation.

[80] See communicant's comments of 23 February 2015, paras. 62-68, citing examples of refusals by the Commission on this basis.

[81] Ibid.

review body; the list is simply illustrative (as indicated by the words "such as" in the chapeau to the provision) and the Committee will not investigate each individual subparagraph. Yet, it follows from the chapeau that article 2, paragraph 2, excludes from the scope of article 10, paragraph 1, all measures taken in the capacity of an administrative review body; and subparagraphs (a) to (d) simply include examples of such measures.

107. Article 2, paragraph 2, should be read in the light of recital (11) to the Aarhus Regulation, which says:

> Given that acts adopted by a Community institution or body acting in a judicial or legislative capacity can be excluded, the same should apply to other inquiry procedures where the Community institution or body acts as an administrative review body under provisions of the Treaty.

108. There is, however, no express exemption from the Convention of measures taken in the capacity of an administrative review body and, notwithstanding the wording of recital (11), it is difficult to imagine how a Community institution or body acting as an administrative review body could be acting in a legislative capacity.

109. The exemption in article 2, paragraph 2, of the Regulation relies on the proposition that acting as an administrative review body is somehow acting in a judicial capacity. Yet, the wording of the Convention provides no support for such a proposition; indeed the wording of the Convention leads to the opposite conclusion.

110. Article 9, paragraph 3, of the Convention provides for access to administrative or judicial procedures, but the tail to article 2, paragraph 2, of the Convention excludes from the definition of "public authority" "bodies acting in a judicial or legislative capacity", but not bodies acting in the capacity of an administrative review body. The conclusion that must be drawn is clear: the Convention distinguishes between judicial and administrative procedures, and excludes public authorities only when they act in a judicial capacity, but not when they act by way of administrative review.

111. While the Committee is not convinced that acts or omissions of all of the review bodies indicated in article 2, paragraph 2, of the Aarhus Regulation, such as the Ombudsman, should be subject to review under article 9, paragraph 3, of the Convention, it doubts that the general exclusion of all administrative acts and omissions by institutions acting in the capacity of administrative review bodies complies with article 9, paragraph 3. Without, however, having any concrete examples of breaches before it, the Committee does not go so far as to find non-compliance in this respect.

Is the internal review procedure an adequate and effective remedy?

112. The communicant argues that the internal review procedure set out in article 10 of the Aarhus Regulation does not constitute an administrative review mechanism for the purpose of article 9, paragraphs 3 and 4, of the Convention as it is neither adequate, effective or fair.

113. The communicant points out that under article 10 the European Union institution that adopted a contested decision conducts an internal review; the communicant submits that it is only natural that the institution will be biased and consider that all the legal and due diligence checks have been made when adopting the decision.

114. Had the internal review procedure been the only available remedy, the Committee would have questioned whether the procedure met the requirements of the Convention; it would need to examine whether the procedure was adequate, effective, fair and equitable as required by the Convention.

115. The internal review, however, is supplemented by article 12 of the Regulation, which provides:

> (1) The non-governmental organisation which made the request for internal review pursuant to Article 10 may institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty.
>
> (2) Where the Community institution or body fails to act in accordance with Article 10(2) or (3) the non-governmental organisation may institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty.

116. Article 12 of the Regulation should be read in the light of the following recitals to the Aarhus Regulation:

> (19) To ensure adequate and effective remedies, including those available before the Court of Justice of the European Communities under the relevant provisions of the Treaty, it is appropriate that the Community institution or body which issued the act to be challenged or which, in the case of an alleged administrative omission, omitted to act, be given the opportunity to reconsider its former decision, or, in the case of an omission, to act.
>
> (20) Non-governmental organisations active in the field of environmental protection which meet certain criteria, in particular in order to ensure that they are independent and accountable organisations that have demonstrated that their primary objective is to promote environmental protection, should be entitled to request internal review at Community level of acts adopted or of omissions under environmental law by a Community institution or body, with a view to their reconsideration by the institution or body in question.
>
> (21) Where previous requests for internal review have been unsuccessful, the non-governmental organisation concerned should be able to institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty.

117. The communicants argue that the judicial procedure established under article 12 might not allow challenging the initial act adopted by the institution and forming the object of the review; if the internal review request has been considered inadmissible, the measure that will be the subject of the judicial proceedings established under article 12 of the Regulation will be the "written reply" from the institution not the original act. The communicant fears that the Court will thus only examine the way the institution has dealt with the internal review request and whether it complied with the procedural requirements of the Regulation, leaving the initial act unexamined.

118. It is for the European Union courts to interpret article 12 of the Aarhus Regulation. For the time being the Committee notes that, while proceedings under article 12, paragraph 2, of the Aarhus Regulation may relate only to the failure of a Community institution or body to act in accordance with article 10, paragraphs 2 or 3, article 12, paragraph 1, appears to provide for proceedings that could have a broader remit and that could go to the substance of an act and to whether there was compliance with article 10, paragraph 2 or 3. It would be consistent with this interpretation to construe article 12, paragraph 1, in the light of recitals (20) and (21), and article 12, paragraph 2, in the light of recital (19).

119. It therefore seems to the Committee that it is possible for the European Courts to interpret article 12 of the Aarhus Regulation in a way that would allow them both to consider failure to comply with article 10, paragraphs 2 and 3, and also the substance of an act falling within article 10, paragraph 1. On that basis, unless and until there is a contrary interpretation by the European Union courts, the Committee does not conclude that article 12 of the Regulation is inconsistent with the requirements of the Convention.

The Aarhus Regulation: conclusion

120. An examination of the communicant's main complaints about the Aarhus Regulation leads to the following conclusion: the Regulation does not correct or compensate for the failings in the European Union jurisprudence, and leaves the Party concerned in non-compliance with article 9, paragraphs 3 and 4, of the Convention.

IV. Conclusions and recommendations

A. Main findings with regard to non-compliance

121. The Committee recalls part I of its findings on the communication, namely that if the jurisprudence of the European Union courts on access to justice were to continue, unless fully compensated for by adequate administrative review procedures, the Party concerned would fail to comply with article 9, paragraphs 3 and 4, of the Convention.[82] Having considered the main jurisprudence of the European Union courts since part I, the Committee finds there has been no new direction in the jurisprudence of the European Union courts that will ensure compliance with the Convention and that the Aarhus Regulation does not correct or compensate for the failings in the jurisprudence (paras. 79 and 120 above).

122. Accordingly, the Committee finds that the Party concerned fails to comply with article 9, paragraphs 3 and 4, of the Convention with regard to access to justice by members of the public because neither the Aarhus Regulation, nor the jurisprudence of the CJEU implements or complies with the obligations arising under those paragraphs.

B. Recommendations

123. The Committee, pursuant to paragraph 35 of the annex to decision I/7, recommends the Meeting of the Parties, pursuant to paragraph 37 (b) of the annex to decision I/7, to recommend to the Party concerned that:

(a) All relevant European Union institutions within their competences take the steps necessary to provide the public concerned with access to justice in environmental matters in accordance with article 9, paragraphs 3 and 4, of the Convention.

(b) If and to the extent that the Party concerned intends to rely on the Aarhus Regulation or other European Union legislation to implement article 9, paragraphs 3 and 4, of the Convention:

(i) The Aarhus Regulation be amended, or any new European Union legislation be drafted, so that it is clear to the CJEU that that legislation is intended to implement article 9, paragraph 3, of the Convention;

(ii) New or amended legislation implementing the Aarhus Convention use wording that clearly and fully transposes the relevant part of the Convention; in particular it is important to correct failures in implementation caused by the use of words or terms that do not fully correspond to the terms of the Convention.

[82] Part I, para. 94.

(c) If and to the extent that the Party concerned is going to rely on the jurisprudence of the CJEU to ensure that the obligations arising under article 9, paragraphs 3 and 4, of the Convention are implemented, the CJEU:

(i) Assess the legality of the European Union's implementing measures in the light of those obligations and act accordingly;

(ii) Interpret European Union law in a way which, to the fullest extent possible, is consistent with the objectives of article 9, paragraphs 3 and 4, of the Convention.

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Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

Compliance Committee

Fifty-seventh meeting
Geneva, 27–30 June 2017
Item 9 of the provisional agenda
Communications from members of the public

Findings and recommendations of the Compliance Committee with regard to communication ACCC/C/2008/32 (part II) concerning compliance by the European Union[1]

Adopted by the Compliance Committee on 17 March 2017*

Contents

[1] The present communication originally concerned non-compliance by the European Community. As of 1 December 2009, the European Union succeeded the European Community in its obligations under the Convention (Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community). The present findings systematically refer to European Union law, institutions and bodies, even if they refer to the status before the entry into force of the Lisbon Treaty.

* This document was submitted late owing to additional time required for its finalization.

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I. Background

1. On 1 December 2008, the non-governmental organization (NGO) ClientEarth (the communicant), supported by a number of entities and a private individual,[2] submitted a communication to the Compliance Committee under the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) alleging a failure by the European Union to comply with its obligations under article 3, paragraph 1, and article 9, paragraphs 2, 3, 4 and 5, of the Convention.[3]

2. That communication is summarized in paragraphs 2 and 3, of the Committee's findings and recommendations with regard to communication ACCC/C/2008/32 (part I) concerning compliance by the European Union,[4] as adopted by the Committee at its thirty-second meeting (Geneva, 11-14 April 2011).

3. Part I of the findings focused on the communicant's main allegation, examining the jurisprudence of the Court of Justice of the European Union (CJEU) on access to justice in environmental matters generally. The Committee considered whether in the *WWF* case[5] the CJEU had accounted for the fact that the Aarhus Convention had entered into force for the Party concerned. The Committee decided not to make specific findings on whether the case in itself amounted to non-compliance with the Convention. In addition, while awaiting the outcome of the *Stichting Milieu* case[6] still pending before the CJEU, the Committee refrained from examining whether Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention to Community institutions and bodies (the Aarhus Regulation)[7] or any other relevant internal administrative review procedure of the European Union met the Convention's requirements on access to justice.

4. The Committee's findings in part I are set out in more detail in paragraphs 41-42 below.

5. On 23 July 2012, the communicant informed the Committee of the European Commission's decision to appeal the General Court's judgment of 14 June 2012 in the *Stichting Milieu* case. At its thirty-eighth meeting (Geneva, 25-28 September 2012), the Committee decided to stay its proceedings with regard to part II of the communication until the Court of Justice adopted its final ruling on the case.[8]

6. On 23 February 2015, the communicant informed the Committee that the Court of Justice had issued its judgment on the appeal proceedings in the *Stichting Milieu* case on 13 January 2015[9] and provided its comments thereon. At the Committee's invitation, the Party concerned provided observations on the communicant's comments on 11 June 2015.

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[2] See ECE/MP.PP/C.1/2011/4/Add.1, footnote 2.

[3] The communication and further correspondence and documents are available from http://www.unece.org/env/pp/compliance/Compliancecommittee/32TableEC.html.

[4] ECE/MP.PP/C.1/2011/4/Add.1.

[5] Case T-91/07, *WWF-UK Ltd v. Council of the European Union*, 2008 E.C.R. II-81; and case C-355/08, *WWF-UK Ltd v. Council of the European Union and the Commission of the European Communities*, 2009 E.C.R. I-73.

[6] Case T-338/08, *Stichting Natuur en Milieu and Pesticides Action Network Europe v. Commission*, ECLI:EU:T:2012:300.

[7] OJ L 264/13, 25.09.2006.

[8] ECE/MP.PP/C.1/2012/8, para. 11.

[9] Joined cases C-404/12 P and C-405/12 P, *Council and Commission v. Stichting Natuur en Milieu and Pesticide Action Network Europe*, ECLI:EU:C:2015:5.

7. The Committee held a hearing to discuss the substance of the communication at its forty-ninth meeting (Geneva, 30 June-3 July 2015), with the participation of representatives of the Party concerned, the communicant and observers.[10] The Committee reconfirmed the admissibility of the communication and commenced deliberations on its draft findings in closed session.

8. The Committee agreed its draft findings on part II of the communication at its fifty-third meeting (Geneva, 21-24 June 2016). In accordance with paragraph 34 of the annex to decision I/7, the draft findings were forwarded to the Party concerned and the communicant on 27 June 2016 for comments by 25 July 2016.

9. On 30 June 2016, the Party concerned requested an extension of the commenting deadline, which was granted by the Chair of the Committee on 13 September, after considering the communicant's views dated 27 July and the clarification by the Party concerned of 29 July.

10. On 17 July 2016, the communicant informed the Committee that it had no comments on the draft findings. On 18 October 2016, the Party concerned submitted its comments on the Committee's draft findings requesting, inter alia, a second hearing on part II.

11. At its fifty-fifth meeting (Geneva, 6-9 December 2016), the Committee considered the request of the Party concerned and decided that it had not put forward any grounds that justified a second hearing.

12. After taking into account the comments received, the Committee finalized its findings in closed session and adopted them through its electronic decision-making procedure on 17 March 2017. The Committee agreed that the findings should be published as a formal pre-session document for its fifty-seventh meeting.

II. Summary of facts, legal framework and issues[11]

A Legal framework

13. Paragraphs 16 to 19 of part I analyse the procedures and remedies for natural and legal persons.

14. In addition, an applicant can plead illegality under article 277 of the Treaty on the Functioning of the European Union (TFEU) (ex article 241 of the Treaty establishing the European Community) of any act of general application adopted by a European Union institution, body, office or agency.[12] Illegality under article 277 can only be invoked as an ancillary plea and is not a cause of action in its own right.

[10] Several observers also provided written statements (see http://www.unece.org/env/pp/compliance/Compliancecommittee/32TableEC.html).

[11] This section summarizes only the main facts, evidence and issues considered to be relevant to the question of compliance, as presented to and considered by the Committee.

[12] Observations by the Party concerned on the communicant's comments on the judgments by the Court of Justice, 11 June 2015, paras. 43 and 46.

B. Substantive issues

Submissions by the communicant

15. The communicant alleges there is a general failure of the Party concerned to comply with its obligations under article 9, paragraph 3, of the Convention with respect to standing of NGOs before the CJEU, claiming that the Court has avoided tackling the key legal issue: the compatibility of article 10, paragraph 1, of the Aarhus Regulation and article 9, paragraph 3, of the Convention.[13]

16. The communicant submits that it is clear from the wording of article 9, paragraph 3, that its scope is "acts and omissions" without restrictions except for decisions adopted within the legislative and judicial capacity of public authorities.

17. The communicant submits that, in contrast to article 9, paragraph 2, article 9, paragraph 3, of the Convention does not apply only to permits but to all acts and omissions. However, in limiting the possibility to resort to the internal review request procedure under article 10 of the Aarhus Regulation to acts of individual scope, the Regulation in fact limits the review procedure to permits and authorizations. Moreover, not all permits and authorizations are considered as administrative acts, but only those addressed to one operator, manufacturer or producer. As a result, very few decisions adopted in environmental matters can be challenged.[14] Therefore, according to the communicant, article 10, paragraph 1, of the Regulation does not implement article 9, paragraph 3, correctly.

18. The communicant submits that the Court could have taken another legal route and proceeded to examine the compatibility of the Regulation with the Convention, either by acknowledging that article 9, paragraph 3, of the Convention is sufficiently precise and unconditional to have direct effect[15] or by relying on different case law, such as the *Biotech* case[16] referred to by the Advocate General in his opinion.[17]

19. The communicant submits that, since part I of the Committee's findings were issued, the jurisprudence of the Court, as illustrated in the *Inuit* case,[18] has not changed its interpretation of the individual concern criterion as set out in article 263, paragraph 4, of the TFEU.[19] The Court reasserted the *Plaumann* case law,[20] which had been deemed too restrictive and barring all access to justice by the Committee in part I of its findings.[21]

[13] Communicant's comments on the judgments by the Court of Justice in cases C-401/12 P to C-405/12 P, 23 February 2015, para. 16.

[14] Ibid., para. 23.

[15] Ibid., paras. 26-27.

[16] Case C-377/98, *Kingdom of the Netherlands v. European Parliament and Council*, 2011 E.C.R. I-7079.

[17] Communicant's comments of 23 February 2015, para. 30, referring to Opinion of Advocate General Jääskinen, 8 May 2014, joined cases C-401/12 P, C-402/12 P and C-403/12 P.

[18] Case C-583/11 P, *Inuit Tapiriit Kanatami v. European Parliament and Council of the European Union*, ECLI:EU:C:2013:625, para. 72.

[19] Communicant's comments of 23 February 2015, para. 33.

[20] The Court held that: "Persons other than those to whom a decision is addressed may only claim to be individually concerned if that decision affects them by reason of certain attributes which are peculiar to them or by reason of circumstances in which they are differentiated from all other persons and by virtue of these factors distinguishes them individually just as in the case of the person addressed". See Case 25/62, *Plaumann & Co v. Commission of the European Economic Community*, 1963 E.C.R. 95.

[21] Communicant's comments of 23 February 2015, para. 34.

20. In addition, the communicant alleges that the criterion "under environmental law" in article 2, paragraph 1 (f), of the Aarhus Regulation, is not in line with article 9, paragraph 3, of the Convention as it constitutes a clear barrier to access to justice.[22]

21. Also, the communicant asserts that the "legally binding and external effects" criterion in article 2, paragraph 1 (g), of the Aarhus Regulation constitutes another barrier to the right to challenge decisions and does not have a basis in article 9, paragraph 3, of the Convention.[23]

22. The communicant alleges that article 2, paragraph 2 (d), of the Convention only excludes decisions of public authorities when acting in their legislative and judicial capacity, not in their administrative capacity. The fact that the institutions act as an administrative review body when adopting these decisions cannot justify their exemption from review.[24]

23. According to the communicant, decisions adopted by the Commission in competition matters are already subject to the Court's scrutiny. Legal or natural persons wanting to challenge them need to fulfil the criteria of "direct and individual concern" in TFEU article 263, paragraph 4, and State aid beneficiaries and their competitors have frequently been granted standing.[25] The communicant maintains that this creates an obvious discrepancy between the right of companies and member States — which have the right to challenge such decisions to protect their economic and commercial interests — and NGOs, which cannot use similar legal means to protect the environment.[26]

24. The communicant reaffirms its arguments on the internal review procedure in article 10 of the Aarhus Regulation as neither adequate, effective or fair.[27] Also, the fact that it is for the European Union institution that adopted the contested decision to decide whether it wants to review its own decision does not ensure an independent or impartial remedy. The communicant submits it is only natural that the institution will be biased and consider that all the legal and due diligence checks were made.[28]

Submissions of the Party concerned

25. The Party concerned does not agree with the communicant's allegations.

26. The Party concerned maintains that the refusal decisions by the European Commission to allow review of Decision C(2009)2560 and Commission Regulation 149/2008[29], quashed by the General Court, were re-established *ex tunc* precisely because the acts that were requested to be reviewed were considered to be of general application, and thus outside the scope of the Aarhus Regulation.[30]

27. The Party concerned stresses that the "alternative legal reasoning" evoked by the communicant arguing that the Court of Justice "could have clearly taken another legal route" disregards these judgments and cannot replace what the Court found.[31]

[22] Ibid., para. 60.
[23] Ibid., para. 69.
[24] Ibid., para. 73.
[25] Ibid., para. 77.
[26] Ibid., para. 78.
[27] Ibid., para. 82.
[28] Ibid., para. 83.
[29] OJ L 58/1, 01.03.2008.
[30] Observations by the Party concerned, 11 June 2015, para. 20.
[31] Ibid., para. 53.

28. According to the Party concerned, it did not fail to comply with article 9, paragraph 3, of the Convention, because that provision cannot be used as a parameter to assess the validity of the Aarhus Regulation. Parties to the Convention have a margin of appreciation as to how they implement article 9, paragraph 3, in their national legal orders, and the European Union institutions have exercised this margin in the context of the Aarhus Regulation.[32]

29. Concerning the implementation of article 9, paragraph 3, the Party concerned states that the European Union aligned its system; article 12 of the Aarhus Regulation gives environmental NGOs legal standing before the European Union courts to ask for review of decisions.[33]

30. In addition, the Party concerned points out that other pieces of European Union legislation contain express provisions on access to justice for members of the public (NGOs and individuals, under certain conditions) within the meaning of the Convention.[34] In this regard, the Party concerned cites a number of CJEU judgments in which the Court recognized the importance of standing for NGOs to ensure the application of European Union legislation and the conditions of standing.[35]

31. The Party concerned underlines that since the European Union has not adopted specific legislation intended to implement article 9, paragraph 3, of the Convention, it remains the responsibility of the European Union member States to implement their obligations under article 9 of the Convention, which, by virtue of TFEU article 216, is part of European Union law.[36]

32. The Party concerned also points to the *Slovak Bears* case[37] where the CJEU held that the national judge should interpret the national procedural law in the light of the Convention to the fullest extent possible and in the light of the principle of effective judicial protection.[38]

33. According to the Party concerned, natural or legal persons who are unable, because of the conditions governing admissibility laid down in TFEU article 263, paragraph 4, to challenge a regulatory act of the European Union directly before the European Union judicature are protected against the application of such an act by the ability to challenge the implementing measures which the act entails.[39] Judicial review of compliance with the European Union legal order is ensured, as can be seen from article 19, paragraph 1, of the Lisbon Treaty and from TFEU article 277, on the one hand, and TFEU article 267, on the other. The Party concerned maintains that acts of European Union institutions are subject to judicial review of their compatibility with, in particular, the treaties, the general principles of law and fundamental rights, as enshrined in the Charter of Fundamental Rights of the European Union.[40]

34. In its comments on the draft findings, the Party concerned argued that a number of the communicant's arguments on the Aarhus Regulation were inadmissible. It submitted that the Committee's recommendations ignored the specific features of the European Union

[32] Ibid., para. 21.
[33] Ibid., para. 24.
[34] Ibid,, paras. 25-30, where the Party concerned cites a body of European Union legislation.
[35] Ibid., para. 32.
[36] Ibid., para. 26.
[37] C-240/09, *Lesoochranárske zoskupenie*, 2011 E.C.R. I-1255.
[38] Ibid., para. 52.
[39] Ibid., para. 42, citing case C-456/13 P, *T & L Sugars Ltd and Sidul Acucares v. Commission*, ECLI:EU:C:2015:284.
[40] Ibid., para. 51.

framework and that it was for the CJEU itself to develop its jurisprudence, which constitutes a continuous process. The Party concerned also complained that the Committee took up a number of arguments introduced by the communicant after February 2015. It submitted that the Committee should not be used for an abstract discussion and that the communicant should have exhausted internal remedies before addressing the Committee, and pointed out that the Committee itself has expressly declared that an *actio popularis* is not what the Convention requires.

35. The Party concerned added that the Aarhus Regulation is not the only means by which the European Union gives effect to the Aarhus Convention and the European Union legal order covers remedies available to individuals through other means. It also argued that the judgment of the Court of Justice in *Stichting Milieu* had to be accepted.

36. The Party concerned also challenged the Committee's draft findings on provisions of the Aarhus Regulation, including those relating to the meaning of "individual scope", "under environmental law", "not having legally binding and external effects" and "measures taken or omissions by a community institution or body in its capacity as an administrative review body". The Party concerned also challenged the draft finding on the effectiveness of the internal review procedure and the scope of judicial review.

37. The communicant responded that the specific features of the European Union legal framework do not allow the Party concerned to ignore the obligations flowing from ratification of the Convention, and that the list of preliminary reference procedures provided by the Party concerned is irrelevant to part II of the findings because they do not compensate for the lack of standing before the European Union courts. The communicant also disagreed with a number of points made by the Party concerned with respect to the Aarhus Regulation.

III. Consideration and evaluation by the Committee

A. Legal basis and scope of considerations of the Committee

38. The European Union signed the Convention on 25 June 1998 and approved it through Council Decision 2005/370/EC of 17 February 2005.[41] The European Union has been a Party to the Convention since 17 May 2005.[42]

The Committee and the CJEU

39. The Committee's role is to review compliance by Parties with their obligations under the Convention.[43] To this end, it may examine compliance issues and make recommendations if and as appropriate.[44] The Committee reports on its activities at each ordinary meeting of the Parties.[45] The Meeting of the Parties may then, upon consideration of the Committee's report and any recommendations, decide upon appropriate measures to bring about full compliance with the Convention.[46] It is, however, for the Parties themselves to implement the obligations under the Convention within their own legal systems.

[41] OJ L 124, 17 May 2005, pp. 1–3.
[42] See part I, paras. 57 and 58.
[43] Decision I/7, annex, para. 1.
[44] Ibid., para. 14.
[45] Ibid., para. 35.
[46] Ibid., para. 37.

40. The CJEU is an institution of the Party concerned and as such is subject to the Committee's review. Here, the Committee considers the effect of the CJEU jurisprudence on the obligations of the European Union arising under the Convention at the time these findings are adopted, without speculating about future changes in that jurisprudence, and without challenging the unquestioned right of the CJEU, as for the courts of any Party, to develop its own jurisprudence, provided it meets the requirements of the Convention.

Scope of the Committee's considerations

41. Part II must be read alongside part I; the two parts form the whole of the Committee's findings on communication ACCC/C/2008/32. While part I must be read in its entirety, the following findings from part I are particularly important for the purposes of understanding this part:

> For at least some acts and omissions by [European Union (EU)] institutions, the Party concerned must ensure that members of the public have access to administrative or judicial review procedures, as set out in article 9, paragraph 3.[47]
>
> The cases referred to by the communicant [in part I] reveal that, to be individually concerned, according to the [European Court of Justice (ECJ)], the legal situation of the person must be affected because of a factual situation that differentiates him or her from all other persons. Thus, persons cannot be individually concerned if the decision or regulation takes effect by virtue of an objective legal or factual situation.[48]
>
> The jurisprudence established by the ECJ [and examined in part I] is too strict to meet the criteria of the Convention.[49]
>
> If the examined jurisprudence of the EU Courts on access to justice were to continue, unless fully compensated for by adequate administrative review procedures, the Party concerned would fail to comply with article 9, paragraph 3, of the Convention.[50]
>
> While the system of judicial review in the national courts of the EU member States, including the possibility to request a preliminary ruling, is a significant element for ensuring consistent application and proper implementation of EU law in its member States, it cannot be a basis for generally denying members of the public access to the EU Courts to challenge decisions, acts and omissions by EU institutions and bodies.[51]
>
> The Committee refrains from any speculation on whether and how the EU Courts will consider the jurisprudence on access to justice in environmental matters on the basis of [article 263, paragraph 4, of] the TFEU.[52]
>
> If the jurisprudence of the EU Courts examined in [part I] were to continue, unless fully compensated for by adequate administrative review procedures, the Party concerned would … fail to comply with article 9, paragraph 4, of the Convention.[53]

[47] Part I, para. 74.
[48] Ibid., para. 86.
[49] Ibid., para. 87.
[50] Ibid., para. 88.
[51] Ibid., para. 90.
[52] Ibid., para. 91.
[53] Ibid., para. 92.

> The allegations concerning costs were not sufficiently substantiated by the communicant.[54]

42. The recommendations in part I were as follows:

> 97. While the Committee is not convinced that the Party concerned fails to comply with the Convention, given the evidence before it, it considers that a new direction of the jurisprudence of the EU Courts should be established in order to ensure compliance with the Convention.
>
> 98. Therefore, the Committee, pursuant to paragraph 36 (b) of the annex to decision I/7, recommends to the Party concerned that all relevant EU institutions within their competences take the steps to overcome the shortcomings reflected in the jurisprudence of the EU Courts in providing the public concerned with access to justice in environmental matters.[55]

43. It follows from paragraph 97 of Part I that, in order to examine whether the Party concerned is in compliance with article 9, paragraphs 3 and 4, of the Convention, the Committee's first task in part II of its findings is to consider whether there is a new direction in the jurisprudence of the European Union courts. Secondly, the Committee needs to consider whether any other steps have been taken to overcome or compensate for the shortcomings reflected in that jurisprudence.

44. In this context, the Committee notes the comment of the Party concerned that "the development of CJEU jurisprudence relating to the Aarhus Convention is a continuous process".[56] The Committee emphasizes that this is not an accepted reason for not complying with the Convention. All Parties to the Convention are required to implement the Convention from the date it enters into force for them.

45. In considering the two issues outlined in paragraph 43 above, the Committee will not assess in detail every possible form of challengeable decision-making by European Union institutions, nor each decision by the European Union courts referred to by the communicant and the Party concerned. Nor will the Committee consider all applicable European Union law that purports to implement the Convention. Instead the Committee will focus on the most important allegations of the communicant,[57] and examine first the most important trends in the jurisprudence of the European Union courts on access to justice in environmental matters since the adoption of part I of its findings. After that, the Committee will consider the effect of the Aarhus Regulation.

B Substantive issues

Jurisprudence of the CJEU: *Stichting Milieu*

The significance of Stichting Milieu

46. In part I, the Committee refrained from examining whether the Aarhus Regulation or any other relevant internal administrative review procedure of the European Union met the requirements on access to justice in the Convention because it was waiting for the outcome of the *Stichting Milieu* case.[58]

[54] Ibid., para. 93.
[55] Ibid.
[56] Comments of the Party concerned on the draft findings, para. 31.
[57] The Committee took a similar approach in part I (see part I, para. 63).
[58] Part I, para. 10.

47. The Committee instead considered and evaluated the established practice of the European Union courts in the light of the Convention's provisions on access to justice; this was on the basis that even if the European Union jurisprudence initiated before the entry into force of the Convention was not consistent with the Convention, that would not lead to the conclusion that the Party concerned was in non-compliance, although it might reveal that the Party concerned would be in non-compliance if the jurisprudence remained the same.[59]

48. The Committee therefore now considers the Court of Justice's judgment in *Stichting Milieu* to determine whether it represents a change in the direction of its jurisprudence, and in particular whether it brings the European Union into compliance with the Convention.

The Stichting Milieu case

49. In *Stichting Milieu*, the General Court considered the effect of article 9, paragraph 3, of the Convention and whether article 10, paragraph 1, of the Aarhus Regulation implemented the Convention. The Court considered it appropriate to examine the validity of article 10, paragraph 1, of the Aarhus Regulation in the light of the Convention. The Court held:

> 72. The term 'acts', as used in Article 9(3) of the Aarhus Convention, is not defined in that convention. According to well-established case-law, an international treaty must be construed by reference to the terms in which it is framed and in the light of its objectives. ...
>
> 73. It is appropriate first of all to recall the objectives of the Aarhus Convention.
> ...
>
> ...
>
> 76. It must be held that an internal review procedure which covered only measures of individual scope would be very limited, since acts adopted in the field of the environment are mostly acts of general application. In the light of the objectives and purpose of the Aarhus Convention, such limitation is not justified.
>
> 77. Also, as regards the terms in which Article 9(3) of the Aarhus Convention is framed, it should be noted that, under those terms, the Parties to that Convention retain a certain measure of discretion with regard to the definition of the persons who have a right of recourse to administrative or judicial procedures and as to the nature of the procedures (whether administrative or judicial). Under Article 9(3) of the Aarhus Convention, only 'where they meet the criteria, if any, laid down in [the] national law, [may] members of the public have access to administrative or judicial procedures'. However, the terms of Article 9(3) of the Aarhus Convention do not offer the same discretion as regards the definition of the 'acts' which are open to challenge. Accordingly, there is no reason to construe the concept of 'acts' in Article 9(3) of the Aarhus Convention as covering only acts of individual scope.
>
> 78. Lastly, so far as the wording of the other provisions of the Aarhus Convention is concerned, it should be noted that, under Article 2(2) of that convention, the concept of 'public authority' does not cover 'bodies or institutions acting in a judicial or legislative capacity'. Accordingly, the possibility that measures adopted by an institution or body of the European Union acting in a judicial or legislative capacity may be covered by the term 'acts', as used in Article 9(3) of the Aarhus Convention, can be ruled out. That does not mean, however, that

[59] Ibid., para. 64.

> the term ‘acts’ as used in Article 9(3) of the Aarhus Convention can be limited to measures of individual scope. There is no correlation between measures of general application and measures taken by a public authority acting in a judicial or legislative capacity. Measures of general application are not necessarily measures taken by a public authority acting in a judicial or legislative capacity.
>
> 79. It follows that Article 9(3) of the Aarhus Convention cannot be construed as referring only to measures of individual scope.
>
> 80. That finding is not undermined by the argument, raised by the Council at the hearing, that limiting ‘administrative acts’ to measures of individual scope is justified in the light of the conditions laid down in Article 230 EC. In that regard, it should be noted that, under Article 12(1) of Regulation No 1367/2006, a non-governmental organisation which has made a request for internal review pursuant to Article 10 of Regulation No 1367/2006 may institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty, hence in accordance with Article 230 EC. However, whatever the scope of the measure covered by an internal review as provided for in Article 10 of Regulation No 1367/2006, the conditions for admissibility laid down in Article 230 EC must always be satisfied if an action is brought before the Courts of the European Union.
>
> 81. Moreover, the conditions laid down in Article 230 EC — and, in particular, the condition that the contested act must be of direct and individual concern to the applicant — apply also to measures of individual scope which are not addressed to the applicant. A measure of individual scope will not necessarily be of direct and individual concern to a non-governmental organisation which meets the conditions laid down in Article 11 of Regulation No 1367/2006. Contrary to the assertions made by the Council, limiting the concept of ‘acts’ exclusively to measures of individual scope does not ensure that the condition laid down in Article 230 EC — that the contested act must be of direct and individual concern to the applicant — will be satisfied.
>
> 82. Accordingly, the Council’s argument that limiting ‘administrative acts’ to measures of individual scope is justified in the light of the conditions laid down in Article 230 EC must be rejected.
>
> 83. It follows from the above that Article 9(3) of the Aarhus Convention cannot be construed as referring exclusively to measures of individual scope. Consequently, in so far as Article 10(1) of Regulation No 1367/2006 limits the concept of ‘acts’, as used in Article 9(3) of the Aarhus Convention, to ‘administrative act[s]’ defined in Article 2(1)(g) of Regulation No 1367/2006 as ‘measure[s] of individual scope’, it is not compatible with Article 9(3) of the Aarhus Convention.[60]

50. The Committee agrees with the above paragraphs of the General Court’s judgment, both as to the effect of article 9, paragraph 3, of the Convention and the failure of article 10, paragraph 1, of the Aarhus Regulation to implement article 9, paragraph 3.

51. In particular, the Committee agrees with the General Court’s analysis that “there is no reason to construe the concept of ‘acts’ in article 9, paragraph 3, of the Convention as covering only acts of individual scope” and that “there is no correlation between measures of general application and measures taken by a public authority acting in a judicial or legislative capacity”. It follows that article 10, paragraph 1, of the Aarhus Regulation fails

[60] Case T-338/08, *Stichting Milieu*.

to correctly implement article 9, paragraph 3, of the Convention insofar as the former covers only acts of individual scope.

52. It is also important to note that while article 9, paragraph 3, allows Parties a degree of discretion to provide criteria that must be met by members of the public before they have access to justice,[61] it does not allow Parties any discretion as to the acts or omissions that may be excluded from implementing laws.

53. The Council of the European Union and the European Commission appealed the General Court's judgment, asking the Court of Justice to set the judgment aside. The Court of Justice neither agreed nor disagreed with the General Court's reasoning in the paragraphs quoted above. Rather, the Court of Justice found:

> 52. … it cannot be considered that, by adopting Regulation No 1367/2006, which concerns only EU institutions and moreover concerns only one of the remedies available to individuals for ensuring compliance with EU environmental law, the European Union was intended to implement the obligations, within the meaning of the case-law cited in paragraph 48 of this judgment, which derive from Article 9(3) of the Aarhus Convention with respect to national administrative or judicial procedures, which, as EU law now stands, fall primarily within the scope of Member State law (see, to that effect, judgment in *Lesoochranárske zoskupenie*, EU:C:2011:125, paragraphs 41 and 47).
>
> 53. It follows from all the foregoing that, in holding that Article 9(3) of the Aarhus Convention could be relied on in order to assess the legality of Article 10(1) of Regulation No 1367/2006, the General Court vitiated its judgment by an error of law.
>
> 54. Accordingly, the judgment under appeal must be set aside, and there is no need to examine the other grounds put forward by the Council and the Commission in support of their appeals.[62]

54. While surprised by the above reasoning, the Committee acknowledges the ruling of the Court of Justice as an interpretation of European Union law. However, by setting aside the judgment of the General Court in this way, the Court left itself unable to mitigate the flaws correctly identified by the General Court. So it remains the case that article 9, paragraph 3, of the Convention is not adequately implemented by article 10, paragraph 1, of the Aarhus Regulation.

55. It follows that the Court of Justice's judgment in *Stichting Milieu* does not bring the Party concerned into compliance with article 9, paragraph 3, and, consequently, article 9, paragraph 4, of the Convention. The Committee will next examine other European Union jurisprudence since part I was adopted to see whether it nevertheless brings the Party concerned into compliance.

Jurisprudence referred to by the Party concerned regarding national implementation

56. At the hearing, the Party concerned drew the Committee's attention to a number of judgments by the European Union courts.[63] While that jurisprudence showed that the

[61] See findings on communication ACCC/C/2005/11 (Belgium) (ECE/MP.PP/C.1/2006/4/Add.2), para. 35.

[62] Joined cases C-401/12 P, C-402/12 P and C-403/12 P, *Stichting Milieu*.

[63] Case C-240/09*, Lesoochranárske zoskupenie VLK v. Ministerstvo životného prostredia Slovenskej republiky*, E.C.R. 2011 I-1255; case C-115/09, *Bund für Umwelt und Naturschutz Deutschland, Landesverband Nordrhein-Westfalen v. Bezirksregierung Arnsberg*, E.C.R. 2011 I-3673; joined cases

obligations arising under the Convention for the European Union and its member States were given due weight on a number of occasions, none of the cases addressed the shortcomings identified in part I. Moreover, the subject matter of much of the jurisprudence cited concerned the enforcement of the Convention in national courts. While it is salutary to learn of the Convention's enforcement at the national level, the Committee already observed in part I that:

> While the system of judicial review in the national courts of the EU member States, including the possibility to request a preliminary ruling, is a significant element for ensuring consistent application and proper implementation of EU law in its member States, it cannot be a basis for generally denying members of the public access to the EU Courts to challenge decisions, acts and omissions by EU institutions and bodies; nor does the system of preliminary review amount to an appellate system with regard to decisions, acts and omissions by the EU institutions and bodies. Thus, with respect to decisions, acts and omissions of EU institutions and bodies, the system of preliminary ruling neither in itself meets the requirements of access to justice in article 9 of the Convention, nor compensates for the strict jurisprudence of the EU Courts, examined … above.[64]

57. The Committee reiterates its above finding that judicial review in the national courts of European Union member States cannot compensate for the strict jurisprudence of the European Union courts examined in part I, and notes that the CJEU itself has held that the system of preliminary ruling does not constitute a means of redress available to the parties to a case pending before a national court or tribunal.[65]

Jurisprudence on Article 263, paragraph 4, of the TFEU

58. In part I, the Committee noted that there was a debate on whether the new article 263, paragraph 4, of the TFEU provided for a possible change of jurisprudence so as to enable members of the public to have standing before the European Union courts.

59. The jurisprudence examined in part I related to the text of (now superseded) article 230, paragraph 4, of the Treaty establishing the European Community. In part I, the Committee noted that the wording of TFEU article 263, paragraph 4, introduced by the Lisbon Treaty and which superseded article 230, paragraph 4, of the Treaty establishing the European Community, is different and could lead to a change of jurisprudence so as to enable members of the public to have standing before the European Union courts. The Committee considered whether TFEU article 263, paragraph 4, could provide the basis for ensuring compliance with article 9 of the Convention. It refrained, however, from speculation on whether and how the European Union courts would consider the jurisprudence on access to justice in environmental matters on the basis of the TFEU.[66]

60. The Committee now considers whether, in the years that have passed since part I was adopted, there has been any sign that, in the light of the jurisprudence of the European

C-128/09 to C-131/09, C-134/09 and C-135/09, *Boxus v. Région wallonne*, 2011 E.C.R. I-9711; case C-182/10, *Solvay v. Région wallonne*, ECLI:EU:C:2012:82; case C-416/10, *Krizan v. Slovenská inšpekcia životného prostredia*, ECLI:EU:C:2013:8; case C-260/11, *Edwards and Pallikaropoulos v. Environment Agency*, ECLI:EU:C:2013:221; case C-72/12, *Gemeinde Altrip v. Land Rheinland-Pfalz*, ECLI:EU:C:2013:712; case C-404/13, *ClientEarth v. the Secretary of State for the Environment, Food and Rural Affairs*, ECLI:EU:C:2014:2382.

[64] Part I, para. 90.

[65] Case 283/81, *CILFIT v. Ministero della Sanità*, 1982 E.C.R. 3415.

[66] Part I, para. 91.

Union courts, TFEU article 263, paragraph 4, ensures compliance with article 9 of the Convention.

61. Article 263, paragraph 4, of the TFEU provides:

> Any natural or legal person may, under the conditions laid down in the first and second paragraphs, institute proceedings against an act addressed to that person or which is of direct and individual concern to them, and against a regulatory act which is of direct concern to them and does not entail implementing measures.

62. The provision has three alternative limbs:

> (a) "Any natural or legal person may … institute proceedings against an act addressed to that person";
>
> (b) "Any natural or legal person may … institute proceedings against an act … which is of direct and individual concern to them";
>
> (c) "Any natural or legal person may … institute proceedings … against a regulatory act which is of direct concern to them and does not entail implementing measures."

63. The first limb is unchanged by the Treaty of Lisbon, and needs no consideration by the Committee because it patently does not implement article 9, paragraph 3, of the Convention.

64. The second limb is little changed by the Treaty of Lisbon and may in any event be quickly dispatched for the purposes of this analysis. Under this limb, a person may only institute proceedings against an act which is of "direct and individual concern to them". It follows from the Committee's findings in part I, which considered the jurisprudence relating to direct and individual concern, that the second limb does not implement article 9, paragraph 3, of the Convention because the restrictions to access to justice imposed by the "direct and individual concern" test are too severe to comply with the Convention.

65. That leaves the third limb. This limb has been considered in the *Inuit* case and the *Microban* case.[67]

66. To assess whether the third limb implements article 9, paragraph 3, it is necessary to consider the meanings of "regulatory act", "of direct concern" and "does not entail implementing measures" in European Union jurisprudence.

67. Before addressing those definitions, the Committee notes that the third limb does not require a person to be individually concerned with a regulatory act. By dropping the individual concern test, the third limb pursues an objective of opening up the conditions for bringing direct actions.[68]

Regulatory act

68. In the *Inuit* case, the CJEU found that the third limb of TFEU article 263, paragraph 4, enabled persons to bring "actions for annulment of acts of general application other than legislative acts". So the Court's interpretation of "regulatory act" is quite narrow in scope.

69. Article 9, paragraph 3, of the Convention requires Parties to give members of the public access to administrative or judicial procedures to challenge "acts and omissions by

[67] Case T-262/10, *Microban International Ltd v Commission*, 2011 E.C.R. II-7697.

[68] See, e.g., *Microban* case, para. 32; *Inuit* case, para. 35.

private persons and public authorities which contravene provisions of its national law relating to the environment". It is clear that at least some acts and failures to act susceptible to judicial review under article 9, paragraph 3, of the Convention will not fall within the category of "acts of general application other than legislative acts". So in the light of the reasoning of the CJEU, the third limb would be too narrow in scope to bring the Party concerned into compliance with article 9, paragraph 3, of the Convention.

70. In any event, the third limb of article 263, paragraph 4, raises other issues for the Committee, as considered below.

Of direct concern

71. The *Microban* case explains the "direct concern" condition in Article 263, paragraph 4, thus:

> 27. ... as regards the condition of direct concern as laid down in the fourth paragraph of Article 230 EC, it has been held that that condition required that, firstly, the contested Community measure must directly affect the legal situation of the individual and, secondly, it must leave no discretion to its addressees, who are entrusted with the task of implementing it, such implementation being purely automatic and resulting from Community rules without the application of other intermediate rules ...

72. The *Microban* case provides a practical example of an organization that met the "direct concern" condition. In that case the applicants, who were found to be directly concerned by a particular measure, bought a particular substance regulated by the measure concerned and used it to manufacture a product with particular properties, which was subsequently sold on for use in manufacture. Thus by being economically affected they were considered by the Court to be directly concerned.

73. It follows from the *Microban* case and the case law referred to therein that an NGO promoting environmental protection would not be directly concerned with a contested measure unless the measure in question directly affected the organization's legal position. Such an organization would always be excluded from instituting proceedings under the third limb of article 263, paragraph 4, when it acted purely for the purposes of promoting environmental protection. The Committee considers that while Parties have a margin of discretion when establishing criteria for the purposes of article 9, paragraph 3, of the Convention, that margin of discretion does not allow them to exclude all NGOs acting solely for the purposes of promoting environmental protection from redress.[69]

74. It follows that the direct concern criterion alone prevents article 263, paragraph 4, from implementing article 9, paragraph 3, of the Convention. But even if this were not the case, the final criterion in the third limb would be problematic.

Does not entail implementing measures

75. In the *Microban* case, the Court reiterated that an act within the scope of the third limb of article 263, paragraph 4, must leave no discretion to its addressees, who are entrusted with the task of implementing it, such implementation being purely automatic and resulting from Community rules without the application of other intermediate rules.

[69] See findings on communication ACCC/C/2005/11 (Belgium) (ECE/MP.PP/C.1/2006/4/Add.2), para. 35.

76. It is clear to the Committee that at least some acts that should be susceptible to administrative or judicial review under article 9, paragraph 3, of the Convention would not meet this criterion.

77. It follows that the third limb of TFEU article 263, paragraph 4, as applied by the European courts, does not implement article 9, paragraph 3, of the Convention; there is no basis in the Convention for excluding from the scope of this provision acts which include implementing measures.

78. The Committee reiterates that, while article 9, paragraph 3, allows Parties a degree of discretion to provide criteria that must be met by members of the public before they have access to justice, it does not allow Parties any discretion as to the acts or omissions that may be excluded from implementing laws (see para. 52 above).

Concluding remarks on jurisprudence

79. Having considered the main jurisprudence of the European Union courts since part I of these findings was adopted, the Committee finds that there has been no new direction in the jurisprudence of the CJEU that will ensure compliance with article 9, paragraph 3, and consequentially, article 9, paragraph 4, of the Convention.

80. In this regard, the Committee notes that in the *Slovak Bears* case, the CJEU made the following findings:

> 49. … if the effective protection of EU environmental law is not to be undermined, it is inconceivable that Article 9(3) of the Aarhus Convention be interpreted in such a way as to make it in practice impossible or excessively difficult to exercise rights conferred by EU law.
>
> 50. It follows that … it is for the national court, in order to ensure effective judicial protection in the fields covered by EU environmental law, to interpret its national law in a way which, to the fullest extent possible, is consistent with the objectives laid down in Article 9(3) of the Aarhus Convention.

81. The Committee regrets that, despite its finding with respect to the national courts, the CJEU does not consider itself bound by this principle. If the European Union courts had been bound in the same way as the national courts, the European Union might have moved towards compliance with article 9, paragraph 3, and consequently article 9, paragraph 4.

82. In addition, according to the current jurisprudence, the European Union courts may not assess whether key provisions in the Aarhus Regulation implement or comply with article 9, paragraph 3. So the Committee must assess whether the provisions of the Aarhus Regulation are consistent with the Convention. If, however, the European Union courts had allowed themselves to rely on article 9, paragraph 3, of the Convention to assess the legality of article 10, paragraph 1, of the Aarhus Regulation that could have assisted the Party concerned to comply with its obligations under the Convention.

The Aarhus Regulation: introduction

83. It now falls to the Committee to consider whether the Aarhus Regulation compensates for the shortcomings in European Union law that have been identified in the above discussion of the jurisprudence by introducing adequate review procedures. In part I the Committee did not examine the Aarhus Regulation, although it indicated that an examination of the Regulation would be forthcoming.[70]

[70] Part I, para. 88.

84. The Party concerned contends that a number of the communicant's arguments relating to the Aarhus Regulation and introduced in its comments of 23 February 2015 are inadmissible and should not have been introduced at that late stage.[71]

85. But it is essential to consider the effect of the Aarhus Regulation in order to determine whether the Party concerned complies with article 9, paragraphs 3 and 4, of the Convention because the Regulation may provide access to justice where the jurisprudence of the CJEU fails to do so. It is thus not possible to make a finding in this case without considering the Regulation. That is why the Committee, in its letter of 19 June 2015, expressly asked the Party concerned and the communicant to address in their statements for the hearing on 1 July 2015 the question: "Does the Aarhus Regulation meet the requirements on access to justice in the Convention?" Therefore the comments from the Party concerned are not valid.

86. Moreover, this case was divided into two parts in order to defer consideration of those elements for which it made sense to await the outcome of the *Stichting Milieu* case. It was always envisaged that the Committee would consider new developments and arguments after that case and the Committee is ready to do so.

87. Article 10, paragraph 1, of the Aarhus Regulation provides that:

> Any non-governmental organisation which meets the criteria set out in Article 11 is entitled to make a request for internal review to the Community institution or body that has adopted an administrative act under environmental law or, in case of an alleged administrative omission, should have adopted such an act.

88. In their update on the Court of Justice's rulings in cases C-401/12 P to C- 405/12 P dated 23 February 2015, the communicants complained that the Aarhus Regulation failed to implement article 9, paragraph 3, of the Convention in five particular areas: acts of individual scope;[72] acts not adopted under environmental law;[73] acts not having legally binding and external effects;[74] arbitrary exemptions to the administrative acts definition;[75] and the adequacy and effectiveness of the internal review procedure.[76]

90. In order to focus on the communicant's main allegations, the Committee will consider those principal complaints, rather than forensically examining every one of the alleged flaws in the Regulation. While for the most part the Committee considers whether the Regulation itself amounts to satisfactory implementation of the obligations of the Party concerned, it also takes into account any jurisprudence regarding the relevant provisions. The Party concerned is required by article 3, paragraph 1, of the Convention to take the necessary legislative, regulatory and other measures to establish and maintain a clear, transparent and consistent framework to implement the Convention, so any flaw in the Regulation may in itself amount to non-compliance.

91. The Committee will first briefly consider the communicant's further allegation that the Aarhus Regulation fails to grant to individuals or entities other than NGOs, such as regional and municipal authorities, access to internal review.[77] The Party concerned is not required to establish an *actio popularis*, but the current jurisprudence of the European Union does not provide access to justice in accordance with article 9, paragraph 3.

[71] Comments of the Party concerned on the draft findings.
[72] Communicant's comments of 23 February 2015, paras. 42-49.
[73] Ibid., paras. 50-60.
[74] Ibid., paras. 61-71.
[75] Ibid., paras. 72-81.
[76] Ibid., paras. 82-84.
[77] Communication, p. 3.

Entities other than NGOs

92. It is clear that article 10, paragraph 1, of the Aarhus Regulation only entitles NGOs that meet particular criteria to make a request for an internal review; yet article 9, paragraph 3, requires "members of the public" that meet the criteria, if any, laid down in the law, to be given access to administrative or judicial procedures.

93. The Committee notes that article 9, paragraph 3, may not be used to effectively bar almost all members of the public from challenging acts and omissions.[78] The term "members of the public" in the Convention includes, but is not limited to, NGOs. It follows that, by barring all members of the public except NGOs meeting the criteria of its article 11, the Aarhus Regulation fails to correctly implement article 9, paragraph 3.

Acts of individual scope

94. As the Committee has already found in paragraph 51 above, article 10, paragraph 1, of the Aarhus Regulation fails correctly to implement article 9, paragraph 3, of the Convention because the former provision covers only acts of individual scope.

Acts not adopted under environmental law

95. Under article 2, paragraph 1 (g), of the Aarhus Regulation:

> "Administrative act" means any measure of individual scope under environmental law, taken by a Community institution or body, and having legally binding and external effects.

96. Under article 2, paragraph 1 (f):

> "Environmental law" means Community legislation which, irrespective of its legal basis, contributes to the pursuit of the objectives of Community policy on the environment as set out in the Treaty: preserving, protecting and improving the quality of the environment, protecting human health, the prudent and rational utilisation of natural resources, and promoting measures at international level to deal with regional or worldwide environmental problems.

97. The combined effect of these provisions is too narrow.

98. Article 9, paragraph 3, of the Convention requires Parties to ensure members of the public have access to administrative or judicial procedures to challenge acts and omissions by private persons and public authorities which "contravene" provisions of its national law relating to the environment.

99. This is not implemented by the Aarhus Regulation, which simply provides for internal review where a Community institution or body has "adopted an act under" environmental law. But article 9, paragraph 3, is broader than that; its requirement is to provide a right of challenge where an act or omission — any act or omission whatsoever by a Community institution or body, including any act implementing any policy or any act under any law — contravenes law relating to the environment.

100. It is clear that, under the Convention, an act may "contravene" laws relating to the environment without being "adopted" under environmental law within the meaning of article 10, paragraph 1, of the Regulation. So it is not consistent with article 9, paragraph 3, of the Convention to exclude from the scope of article 10, paragraph 1, any act or omission

[78] See findings on communication ACCC/C/2006/18 (Denmark) (ECE/MP.PP/2008/5/Add.4), paras. 30-31).

made under European Union legislation which does not "contribute to the pursuit of the objectives of Community policy on the environment as set out in the Treaty".[79] Depending on the circumstances, such an act or omission may contravene a law relating to the environment. The correct test is not whether an act is adopted under law of any description.

Acts not having legally binding and external effects

101. While article 9, paragraph 3, allows Parties a degree of discretion to provide criteria that must be met by members of the public before they have access to justice, it does not allow Parties any discretion as to the acts that may be excluded from implementing laws.

102. The communicant complains that article 2, paragraph 1 (g), of the Aarhus Regulation requires a measure to have "legally binding and external effects" before that measure falls within the definition of "administrative act", and thus within the scope of article 10, paragraph 1. The communicant gives evidence that on a number of occasions administrative review of an act has been refused because of this requirement[80] and argues that the "legally binding and external effect" criterion constitutes another barrier to the right to challenge decisions and does not have a basis in article 9, paragraph 3, of the Convention.

103. The Aarhus Regulation does not provide much explanation for the use of this criterion. While recital (11) is related to the issue, it simply contains the following bald assertion: "Administrative acts of individual scope should be open to possible internal review where they have legally binding and external effects." In this context the reasoning used by the Committee to find that the "individual scope" criterion is invalid (see para. 51 above) applies by analogy. The Committee is not convinced that generally excluding all acts that do not have legally binding and external effects is compatible with article 9, paragraph 3, of the Convention. It appears that some acts by the Party concerned that do not have legally binding or external effect, including some or all of those referred to by the communicant,[81] might be covered by article 9, paragraph 3.

104. It follows that article 10, paragraph 1, of the Aarhus Regulation fails to implement article 9, paragraph 3, of the Convention insofar as it covers only administrative acts, or omissions to adopt such acts, that have legally binding and external effects.

The exemption of administrative review

105. Article 2, paragraph 2, of the Aarhus Regulation provides:

> Administrative acts and administrative omissions shall not include measures taken or omissions by a Community institution or body in its capacity as an administrative review body, such as under:
>
> (a) Articles 81, 82, 86 and 87 of the Treaty (competition rules);
>
> (b) Articles 226 and 228 of the Treaty (infringement proceedings);
>
> (c) Article 195 of the Treaty (Ombudsman proceedings);
>
> (d) Article 280 of the Treaty (OLAF proceedings).

106. It is important to note that the list of provisions in article 2, paragraph 2 (a) to (d), of the Regulation do not amount to an exhaustive list of measures taken in the capacity of a

[79] See definition of "environmental law" in article 2, para. 2 (f), of the Aarhus Regulation.

[80] See communicant's comments of 23 February 2015, paras. 62-68, citing examples of refusals by the Commission on this basis.

[81] Ibid.

review body; the list is simply illustrative (as indicated by the words "such as" in the chapeau to the provision) and the Committee will not investigate each individual subparagraph. Yet, it follows from the chapeau that article 2, paragraph 2, excludes from the scope of article 10, paragraph 1, all measures taken in the capacity of an administrative review body; and subparagraphs (a) to (d) simply include examples of such measures.

107. Article 2, paragraph 2, should be read in the light of recital (11) to the Aarhus Regulation, which says:

> Given that acts adopted by a Community institution or body acting in a judicial or legislative capacity can be excluded, the same should apply to other inquiry procedures where the Community institution or body acts as an administrative review body under provisions of the Treaty.

108. There is, however, no express exemption from the Convention of measures taken in the capacity of an administrative review body and, notwithstanding the wording of recital (11), it is difficult to imagine how a Community institution or body acting as an administrative review body could be acting in a legislative capacity.

109. The exemption in article 2, paragraph 2, of the Regulation relies on the proposition that acting as an administrative review body is somehow acting in a judicial capacity. Yet, the wording of the Convention provides no support for such a proposition; indeed the wording of the Convention leads to the opposite conclusion.

110. Article 9, paragraph 3, of the Convention provides for access to administrative or judicial procedures, but the tail to article 2, paragraph 2, of the Convention excludes from the definition of "public authority" "bodies acting in a judicial or legislative capacity", but not bodies acting in the capacity of an administrative review body. The conclusion that must be drawn is clear: the Convention distinguishes between judicial and administrative procedures, and excludes public authorities only when they act in a judicial capacity, but not when they act by way of administrative review.

111. While the Committee is not convinced that acts or omissions of all of the review bodies indicated in article 2, paragraph 2, of the Aarhus Regulation, such as the Ombudsman, should be subject to review under article 9, paragraph 3, of the Convention, it doubts that the general exclusion of all administrative acts and omissions by institutions acting in the capacity of administrative review bodies complies with article 9, paragraph 3. Without, however, having any concrete examples of breaches before it, the Committee does not go so far as to find non-compliance in this respect.

Is the internal review procedure an adequate and effective remedy?

112. The communicant argues that the internal review procedure set out in article 10 of the Aarhus Regulation does not constitute an administrative review mechanism for the purpose of article 9, paragraphs 3 and 4, of the Convention as it is neither adequate, effective or fair.

113. The communicant points out that under article 10 the European Union institution that adopted a contested decision conducts an internal review; the communicant submits that it is only natural that the institution will be biased and consider that all the legal and due diligence checks have been made when adopting the decision.

114. Had the internal review procedure been the only available remedy, the Committee would have questioned whether the procedure met the requirements of the Convention; it would need to examine whether the procedure was adequate, effective, fair and equitable as required by the Convention.

115. The internal review, however, is supplemented by article 12 of the Regulation, which provides:

> (1) The non-governmental organisation which made the request for internal review pursuant to Article 10 may institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty.
>
> (2) Where the Community institution or body fails to act in accordance with Article 10(2) or (3) the non-governmental organisation may institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty.

116. Article 12 of the Regulation should be read in the light of the following recitals to the Aarhus Regulation:

> (19) To ensure adequate and effective remedies, including those available before the Court of Justice of the European Communities under the relevant provisions of the Treaty, it is appropriate that the Community institution or body which issued the act to be challenged or which, in the case of an alleged administrative omission, omitted to act, be given the opportunity to reconsider its former decision, or, in the case of an omission, to act.
>
> (20) Non-governmental organisations active in the field of environmental protection which meet certain criteria, in particular in order to ensure that they are independent and accountable organisations that have demonstrated that their primary objective is to promote environmental protection, should be entitled to request internal review at Community level of acts adopted or of omissions under environmental law by a Community institution or body, with a view to their reconsideration by the institution or body in question.
>
> (21) Where previous requests for internal review have been unsuccessful, the non-governmental organisation concerned should be able to institute proceedings before the Court of Justice in accordance with the relevant provisions of the Treaty.

117. The communicants argue that the judicial procedure established under article 12 might not allow challenging the initial act adopted by the institution and forming the object of the review; if the internal review request has been considered inadmissible, the measure that will be the subject of the judicial proceedings established under article 12 of the Regulation will be the "written reply" from the institution not the original act. The communicant fears that the Court will thus only examine the way the institution has dealt with the internal review request and whether it complied with the procedural requirements of the Regulation, leaving the initial act unexamined.

118. It is for the European Union courts to interpret article 12 of the Aarhus Regulation. For the time being the Committee notes that, while proceedings under article 12, paragraph 2, of the Aarhus Regulation may relate only to the failure of a Community institution or body to act in accordance with article 10, paragraphs 2 or 3, article 12, paragraph 1, appears to provide for proceedings that could have a broader remit and that could go to the substance of an act and to whether there was compliance with article 10, paragraph 2 or 3. It would be consistent with this interpretation to construe article 12, paragraph 1, in the light of recitals (20) and (21), and article 12, paragraph 2, in the light of recital (19).

119. It therefore seems to the Committee that it is possible for the European Courts to interpret article 12 of the Aarhus Regulation in a way that would allow them both to consider failure to comply with article 10, paragraphs 2 and 3, and also the substance of an act falling within article 10, paragraph 1. On that basis, unless and until there is a contrary interpretation by the European Union courts, the Committee does not conclude that article 12 of the Regulation is inconsistent with the requirements of the Convention.

The Aarhus Regulation: conclusion

120. An examination of the communicant's main complaints about the Aarhus Regulation leads to the following conclusion: the Regulation does not correct or compensate for the failings in the European Union jurisprudence, and leaves the Party concerned in non-compliance with article 9, paragraphs 3 and 4, of the Convention.

IV. Conclusions and recommendations

A. Main findings with regard to non-compliance

121. The Committee recalls part I of its findings on the communication, namely that if the jurisprudence of the European Union courts on access to justice were to continue, unless fully compensated for by adequate administrative review procedures, the Party concerned would fail to comply with article 9, paragraphs 3 and 4, of the Convention.[82] Having considered the main jurisprudence of the European Union courts since part I, the Committee finds there has been no new direction in the jurisprudence of the European Union courts that will ensure compliance with the Convention and that the Aarhus Regulation does not correct or compensate for the failings in the jurisprudence (paras. 79 and 120 above).

122. Accordingly, the Committee finds that the Party concerned fails to comply with article 9, paragraphs 3 and 4, of the Convention with regard to access to justice by members of the public because neither the Aarhus Regulation, nor the jurisprudence of the CJEU implements or complies with the obligations arising under those paragraphs.

B. Recommendations

123. The Committee, pursuant to paragraph 35 of the annex to decision I/7, recommends the Meeting of the Parties, pursuant to paragraph 37 (b) of the annex to decision I/7, to recommend to the Party concerned that:

(a) All relevant European Union institutions within their competences take the steps necessary to provide the public concerned with access to justice in environmental matters in accordance with article 9, paragraphs 3 and 4, of the Convention.

(b) If and to the extent that the Party concerned intends to rely on the Aarhus Regulation or other European Union legislation to implement article 9, paragraphs 3 and 4, of the Convention:

(i) The Aarhus Regulation be amended, or any new European Union legislation be drafted, so that it is clear to the CJEU that that legislation is intended to implement article 9, paragraph 3, of the Convention;

(ii) New or amended legislation implementing the Aarhus Convention use wording that clearly and fully transposes the relevant part of the Convention; in particular it is important to correct failures in implementation caused by the use of words or terms that do not fully correspond to the terms of the Convention.

[82] Part I, para. 94.

(c) If and to the extent that the Party concerned is going to rely on the jurisprudence of the CJEU to ensure that the obligations arising under article 9, paragraphs 3 and 4, of the Convention are implemented, the CJEU:

(i) Assess the legality of the European Union's implementing measures in the light of those obligations and act accordingly;

(ii) Interpret European Union law in a way which, to the fullest extent possible, is consistent with the objectives of article 9, paragraphs 3 and 4, of the Convention.

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ECONOMIC COMMISSION FOR EUROPE

Meeting of the Parties to the
Convention on Access to Information,
Public Participation in Decision-making and
Access to Justice in Environmental Matters

Compliance Committee

Geneva, 29–31 March 2006

REPORT ON THE ELEVENTH MEETING

Addendum

FINDINGS AND RECOMMENDATIONS

with regard to compliance by Armenia with its obligations under the Aarhus Convention in relation to the development of the Dalma Orchards area
(Communication ACCC/C/2004/08 by the Center for Regional Development/Transparency International Armenia, the Sakharov Armenian Human Rights Protection Center and the Armenian Botanical Society (Armenia))

Adopted by the Aarhus Convention's Compliance Committee on 31 March 2006

INTRODUCTION

1. On 20 September 2004, three Armenian non-governmental organizations (NGOs), the Center for Regional Development/Transparency International Armenia, the Sakharov Armenian Human Rights Protection Center and the Armenian Botanical Society, submitted a

communication to the Committee alleging non-compliance by Armenia with its obligations under article 4, paragraphs 1 and 2; article 6, paragraphs 1–5 and 7–9; article 7; article 8; and article 9, paragraph 2, of the Aarhus Convention.

2. The communication concerns access to information and public participation in the decision-making on modification of land use designation and zoning as well as on the leasing of certain plots in an agricultural area of Dalma Orchards. The communicants claim that their right to information, guaranteed under article 4, paragraphs 1 and 2, of the Convention, was violated by the public authorities' failure to respond to information requests and to provide adequate and complete information. The communicants also claim that, in adopting the relevant decrees, the Government failed to notify the public about the decision-making process; to ensure public participation in it, including by taking account of the public comments; and to publish the adopted decisions. They allege that these omissions constituted failure to comply with multiple provisions of articles 6 and 7 of the Convention. They also allege that adoption of government decrees without a public participation procedure contravenes article 8 of the Convention. They further claim that a failure to address the administrative appeals challenging the relevant decisions and a failure to provide for an appropriate judiciary appeal procedure constitute non-compliance with article 9, paragraph 2, of the Convention. The communication is available in full at http://www.unece.org/env/pp/pubcom.htm.

3. The communication was forwarded to the Party concerned on 22 October 2004 after a preliminary determination of its admissibility.

4. A response was received from the Party concerned on 2 April 2005 indicating that, in accordance with Armenian legislation, government decrees can be challenged only in the Constitutional court. The Party maintained that the other matters addressed in the communication did not fall under the Convention. In its comments on the draft findings and recommendations, the Party provided further information with regard to legislative developments and practical measures underway in Armenia. In particular, it noted proposed changes to the Constitution which will provide members of the public with standing in the Constitutional Court[1], as well as the draft law on Administration, which aims to make decisions such as those described in paragraph 10 below subject to review by the administrative courts. It also mentioned publication of a guide to the implementation of the Convention and a training event for legal professionals organized in 2005.

5. The Committee at its fourth meeting (MP.PP/C.1/2004/6, para. 26) determined on a preliminary basis that the communication was admissible, subject to review following any comments received from the Party concerned. Having reviewed the arguments put forward by the Party concerned in its response and having further consulted with both parties at its eighth meeting, the Committee hereby confirms the admissibility of the communication, deeming the points raised by the Party concerned to be of substance rather than related to admissibility.

6. The Committee discussed the communication at its eighth meeting (22–24 May 2005), with the participation of representatives of both the Party concerned and the communicants, both of whom provided additional information.

[1] Following the adoption of these recommendations, the Committee became aware that these changes to the Constitution of Armenia had been made (see: http://www.president.am/library/eng/?task=41&id=1).

7. In accordance w ith paragraph 34 and with reference to paragraph 36 (b) of the annex to decision I/7, the draft findings and recommendations were forwarded for comment to the Party concerned and to the communicants on 18 October 2005. Both were invited to provide comments, if any, by 17 November 2005. Comments were received from the communicants on 16 November 2005. At the request of the Party concerned, the Committee extended the commenting deadline to accommodate a wider consultation process on the findings and recommendations in the country. The Party concerned provided its comments on 2 February 2006. The Committee, having reviewed the comments, took them into account in finalizing its findings and recommendations by amending the draft where the comments, in its opinion, necessitated changes in the presentation of the facts or the Committee's consideration, evaluation or conclusions.

I. SUMMARY OF FACTS[2]

8. Dalma Orchards is an agricultural area of historical, cultural and environmental value in the south-western part of the Armenian capital, Yerevan. In 1989, the area was included in the Plan for Preservation and Use of Historical and Cultural Monuments. The Plan was approved in 1991 by the Mayor of Yerevan. However, in 2000, this decision was annulled for all sites of historical or cultural value in the city, and no new list has been developed.

9. In December 2003, the district administration rejected a request submitted by the then-lessees of Dalma Orchards for extension of their leases. The rejection letter indicated tha t the Yerevan municipality already had in place an area development plan. The municipality confirmed the existence of the area development plan at a meeting organized by NGOs. It clarified that the plan had been adopted by the Government of Armenia and was not subject to change.

10. An inquiry into the matter by a group of NGOs identified five decrees with regard to the area in question adopted by the Government of Armenia in the period between March 2003 and March 2004:

(a) Decree 1941-A of 27 March 2003 "On Modifying the Boundaries and Designated Use of the Conservable Land in the Dalma Orchards of Yerevan", ratified by the President of the Republic of Armenia on 29 March 2004;

(b) Decree 503-A of 27 March 2003 "On Providing Lease over Land Plots to the 'Renko Armestate' Limited Liability Company and the 'Frank Muller' Closed Joint-Stock Company without Tender", ratified by the President of the Republic of Armenia on 15 May 2003;

(c) Decree 745-A of 25 June 2003 "On Modifying the Designated Use of Land and Providing Lease over a Land Plot to Tavros Galshoyan and Syranuysh Galshoyan without Tender", ratified by the President of the Republic of Armenia on 25 June 2003;

(d) Decree 1281-A of 11 September 2003 "On Modifying the Designated Use of Land and Providing a Land Plot to the 'Armenian Airways' Closed Joint-Stock Company", ratified by the President on 23 October 2003; and

[2] This chapter includes only the main facts considered relevant to the question of compliance, as presented to and considered by the Committee.

(e) Decree 397-A of 31 March 2004 "On Zoning of Areas and Modifying the Designated Use of Land", ratified by the President on 6 April 2004.

Another decree with regard to the land use on the territory was adopted on 21 October 2004 without prior notice or public consultation.

11. The decrees were adopted as stand-alone acts. No public participation was provided for in the course of the decision-making process. Consequently, any comments provided by the public were provided following the formal adoption of the decrees and were not taken into account. Moreover, stand-alone acts, in accordance with Armenian legislation, are not subject to publication. At the Committee's eighth meeting, the representatives of Armenia confirmed that regulation of the matters in question through stand-alone decrees was not legally required. The communicants maintain that, in accordance with article 7 of the Armenian Land Code, changes of land use designation should be dealt with through normative regulation of general applicability rather than stand-alone acts applying to a defined piece or pieces of land.

12. The types of activity for which the land was designated (e.g. construction of houses, buildings or complexes, other planned activities exceeding the threshold value of 1,000 square metres, and forest restoration) should be subject to an environmental impact assessment (EIA) procedure in accordance with the Armenian Law on Environmental Impact Assessment. This procedure, in turn, requires public participation. It is not clear from the facts presented to the Committee whether a further (article 6-type) permitting process must be undergone, with public participation, before any specific activity can proceed.

13. Several requests for information were sent to various public authorities by the communicants, including:

(a) a letter of 19 March 2004 to the Chairperson of the State Real Estate Cadastre Committee requesting information about the boundaries of Dalma Orchards, the category of land to which Dalma Orchards belonged, the administrative area the land was in, whether there were leases issued for the land on this territory (and, if so, their boundaries) and what plans and programmes had been developed for the area;
(b) a letter of 31 May 2004 to the Mayor of Yerevan requesting information about decisions on the allocation of 533 hectares of land in Dalma Orchards, the duration of leases and proposed activities, whether and in what way the public had been informed of the proposed modifications of the land-use, and whether any public comments had been received; and
(c) a letter of 3 August 2004 to the Mayor of Yerevan requesting access to documents that had served as a basis for the adoption of the government decrees referred to in paragraph 10 above and maps annexed to the decrees, and requesting information as to the location of land plots allocated by the decrees for particular activities.

Some of the requests, such as those mentioned in subparagraphs (a) and (c) above, were not answered at all, while others, such as the letter referred to in subparagraph (b), were answered only partially.

14. On 9 August 2004, the communicants filed a lawsuit with the first-instance district court of Yerevan appealing the five government decrees on grounds of violations of the Aarhus

Convention, the Armenian Law on Environmental Impact Assessment, the Law on Urban Development and the Land Code. They petitioned for a writ to declare the government decree null and void. The lawsuit was determined inadmissible for lack of jurisdiction. In particular, the court specified that the conformity of the government decrees with the Constitution of Armenia could be established only by the Constitutional Court of Armenia. The determination was left standing by the appellate instance.

15. According to Armenian legislation, only three institutions may make appeals to the Constitutional Court: the National Assembly, the Government and the President. The communicants point out that they approached these three institutions prior to or at the time of filing a lawsuit. In their responses to a request from one of the communicants, the Head of the Standing Committee of the National Assembly (letter of 15 June 2004) and the Head of the Department of Expertise of the Ministry of Justice (letter of 12 September 2004) recommended that the communicants appeal the decrees in the court of first instance.

II. CONSIDERATION AND EVALUATION BY THE COMMITTEE

16. Armenia deposited its instrument of ratification of the Convention on 1 August 2001. The Convention entered into force for Armenia on 30 October 2001.

17. The Convention, as an international treaty ratified by Armenia, has direct applicability in the Armenian legal system. All the provisions of the Convention are directly applicable, including by the courts.

18. The communicants are NGOs that fall under the definition of "the public" as set out in article 2, paragraph 4, of the Convention. The Committee considers that all the communicants, being registered NGOs and having expressed an interest in the decision-making process, fall within the definition of "the public concerned" as set out in article 2, paragraph 5.

19. The agencies referred to in the communication with regard to provision of information and public participation in the decision-making process fall under the definition of "public authority" in article 2, paragraph 2 (a), of the Convention.

20. The issuing of government decrees on land use and planning constitutes "measures" within the meaning of article 2, paragraph 3 (b), of the Convention. In the Committee's opinion, the information referred to in paragraph 13 above clearly falls under the definition of "environmental information" under article 2, paragraph 3.

21. It is therefore the opinion of the Committee that, as public authorities within the meaning of article 2, paragraph 2 (a), the State Real Estate Cadastre Committee and the Office of the Mayor of Yerevan were under an obligation to provide the environmental information requested by the communicants pursuant to article 4, paragraph 1, and that their failure to do so or to respond within the time limits indicated in the article was not in conformity with provisions of article 4, paragraphs 1 and 2.

22. The Committee notes that the communicants do not appear to have used domestic appeal procedures to challenge the failure of the public authorities to provide information, and have not provided any information to the Committee as to why they did not do so. They do not cite article 9, paragraph 1, among the articles that they claim have been breached.

23. The government decrees referred to in the communication, in particular decrees 503-A, 745-A (paras. 2 and 3) and 1281-A (para. 2), deal with the designation of land for a particular type of commercial activity. Typically, this would be considered as a type of decision falling within the scope of article 7 of the Convention. However, some of the decrees specify not only the general type of activity (e.g. manufacturing, agriculture) that may be carried out in the designated areas but also the specific activity (e.g. watch-making factory, construction of a diplomatic complex) and even the names of the companies or enterprises that would undertake these activities. These elements are more characteristic of a type of decision falling within the scope of article 6 of the Convention. The implications with respect to articles 7 and 6 are considered in turn in paragraphs 24–27 and 28–33 respectively.

24. Decree 1941-A, provisions of paragraph 1 of decree 745-A and paragraph 1 of decree 1281-A, and decree 397-A, in the Committee's opinion, relate to land-use planning. The first three change the designation of land use in the existing zoning plan, while the fourth adopts the territorial zoning plan of the area and modifies the designated use of lands.

25. In the Committee's view, such plans fall under article 7 of the Convention and are subject to the public participation requirements contained therein, including, *inter alia,* the application of the provisions in paragraphs 3, 4 and 8 of article 6. The Committee therefore finds that the failure to ensure public participation in the preparation of plans such as those referred to in paragraph 21 above constitutes non-compliance with article 7 of the Convention.

26. It is noteworthy that the failure to provide for public participation in this case appears to also contravene Armenian national legislation. The Armenian Law on Environmental Impact Assessment (article 15, paragraphs 3 and 4) requires that, *inter alia,* socio-economic, urban construction, industrial and environmental protection plans, programmes, complex designs and master plans be subject to public hearings and be communicated to the public at least 30 days in advance of the hearing. The law also requires that public opinion be taken into consideration.

27. In the Committee's opinion, the difficulties related to compliance with articles 4 and 7 of the Convention lie not in the lack of a regulatory framework but rather in deficiencies in implementation and enforcement.

28. The extent to which the provisions of article 6 apply in this case depends *inter alia* on the extent to which the decrees (or some of them) can be considered "decisions on specific activities", that is, decisions that effectively pave the way for specific activities to take place. While the decrees are not typical of article 6-type decisions on the permitting of specific activities, some elements of them are (as is mentioned in paragraphs 12 and 23 above) more specific than a typical decision on land use designation would normally be. The Convention does not establish a precise boundary between article 6-type decisions and article 7-type decisions. Notwithstanding that, the fact that some of the decrees award leases to individual named enterprises to undertake quite specific activities leads the Committee to believe that,

in addition to containing article 7–type decisions, some of the decrees do contain decisions on specific activities.

29. Another question that arises is whether a further, more detailed permitting process, with public participation, is envisaged for the various specific activities. The information available to the Committee on this point is somewhat ambiguous. The communicants maintain that Armenian legislation requires that an EIA be carried out, with public participation, for such activities (see para. 10). If this takes place, it would certainly help to mitigate the lack of public participation in the formulation of the decrees. However, even if public participation is included at that stage, the scope of the decision on which the public would be consulted would be more limited than should be the case for article 6–type decisions, in the sense that some options (such as the option of not building any watch factory at a particular location) would no longer be open for discussion (cf. article 6, para. 4).

30. If no further permitting process is envisaged, then the question of compliance with article 6 arises more starkly. On the basis of the information available to it, the Committee is not able to identify whether any of the activities concerned fall under the categories listed in paragraphs 1–19 of Annex I to the Convention. It does, however, note that the fact that under the Armenian legislation these activities are subject to an environmental assessment procedure, including public participation, as described in paragraph 12 above, brings them within the scope of paragraph 20 of Annex I of the Convention. Furthermore, the fact that an EIA procedure is foreseen for such acts points to the Armenian legislator's recognition of their potential environmental impact. Thus, the decisions referred to in paragraph 24 above could be seen as subject to article 6, paragraph 1(b) of the Convention.

31. The Party concerned pointed out at the Committee's eighth meeting that, even though the decrees in question had not been published, they could be now accessed through an electronic database. However, in the Committee's view, such an approach does not satisfy the requirement of article 6, paragraph 9, of the Convention to promptly inform the public of the decision.

32. The representatives of Armenia presented no evidence to the Committee that the decision-making on the proposed activities was still at a stage where all options remained open. The Committee therefore concludes that the decision-making with regard to specific activities was not done in accordance with the requirements of article 6, paragraph 1 (b), and, in conjunction with it, article 6, paragraphs 2–9 of the Convention.

33. The Committee also wishes to point out that, on the basis of the information available to it, detailed regulation appears to be lacking where public participation in decision-making on specific activities is concerned. While the Law on Environmental Impact Assessment itself provides some of the details, the elaboration of a more specific procedure in secondary legislation or in the form of guidelines might be advisable.

34. The communicants allege that failure to ensure public participation in the development and adoption of the government decrees referred to in paragraph 10 above constitutes non-compliance with article 8 of the Convention. In the Committee's understanding, however, the decrees in question do not fall under generally applicable legally binding rules. Rather, they

seem to constitute a form of adopting decisions on plans for designation of land (article 7) and to some extent a form of decisions mandating specific activities (article 6).

35. With regard to access to justice, the communicants claim that they were denied access to a review procedure to challenge the substantive and procedural legality of the government decrees which, they argue, should be guaranteed under article 9, paragraph 2, of the Convention. The relevance of article 9, paragraph 2, would depend on the extent to which article 6 is applicable, and, as was stated above (paras. 28–32), the Committee considers that, while the decrees primarily concern article 7 decision-making, some of their elements fall within the scope of article 6, and that therefore provisions of article 9, paragraph 2, apply.

36. The communicants also point out that they were denied access to review procedures to challenge the land designation aspect of the decrees. In this respect the Committee notes that the subject matter of the decrees is regulated in detail by both Armenian environmental laws (such as the Law on Environmental Impact Assessment) and laws regulating urban planning. Moreover, these laws require that the public be consulted in the process of such decision-making. It is therefore the Committee's opinion that the communicants, in accordance with article 9, paragraph 3, should have had access to a review procedure to challenge the decisions, which deal with such subject matter and which they believed to contradict their national law relating to the environment.

37. The lawsuit challenging the legality of the decrees and petitioning for a writ to declare them null and void was dismissed by the district court for lack of jurisdiction. The decision of the court points out that the Civil Procedure Code prevents courts from declaring null and void for any reason decisions whose constitutionality is subject to review by the Constitutional court. It further notes that the Constitution of Armenia provides for a review of the constitutionality of government decisions by the Constitutional Court only. However, as the communicants point out, only three institutions have standing in the Constitutional Court (see para. 15 above). Two of these represent the executive that issues government decrees, and the third constitutes a large proportion of the national legislative body. In the Committee's opinion, such an approach does not ensure that members of the public have access to review procedures.

38. However, in the Committee's opinion, the problem is not so much with the issue of jurisdiction or standing. Rather, it is connected to the fact that planning decisions whose subject matter is regulated by environmental legislation, and decisions on specific activities which, in accordance with the Convention, should be subject to an administrative or judicial review, were taken through a procedure that provides no possibility for the public to participate and no remedies. The Committee acknowledges that national legislature, as a matter of principle, has the freedom to protect some acts of the executive from judicial review by regular courts through what is known as ouster clauses in laws. However, to regulate matters subject to articles 6 and 7 of the Convention exclusively through acts enjoying the protection of ouster clauses would be to effectively prevent the use of access-to-justice provisions. Where the legislation gives the executive a choice between an act that precludes participation, transparency and the possibility of review and one that provides for all of these, the public authorities should not use this flexibility to exempt from public scrutiny or judicial review matters which are routinely subject to administrative decisions and fall under specific procedural requirements under domestic law. Unless there are compelling reasons, to do so would risk violating the principles of the

Convention. In this case, the Committee has not been made aware of any compelling reason justifying the choice of this form of decision-making.

39. The Committee finds this approach to be out of compliance with the obligations to ensure that members of the public concerned have access to a review procedure and to provide adequate and effective remedies in accordance with article 9, paragraphs 2–4, of the Convention. At the same time, the Committee notes the information provided to it by the Party concerned with regard to proposed legislative changes described in paragraph 4 above. In the Committee's opinion, such changes will, if implemented, bring the situation into compliance with article 9 of the Convention.

III. CONCLUSIONS

40. Having considered the above, the Committee adopts the findings and recommendations set out in the following paragraphs.

A. Main findings with regard to non-compliance

41. The Committee finds that by failing to ensure that bodies performing public functions implement the provisions of article 4, paragraphs 1 and 2, of the Convention, Armenia was not in compliance with that article.

42. The Committee also finds that by failing to ensure effective public participation in decision-making on specific activities, the Government of Armenia did not comply fully with article 6, paragraph 1 (a); with annex I, paragraph 20, of the Convention; or, in connection with this, with article 6, paragraphs 2–5 and 7–9. It considers that the extent of non-compliance would be somewhat mitigated if public participation were to be provided for in further permitting processes for the specific activities in question, but it notes that the requirement under article 6, paragraph 4, to ensure that early public participation is provided for when all options are open would still have been breached. In this regard, the Committee notes, however, the information provided to it by the Government of Armenia regarding the new draft law on Environmental Impact Assessment and understands that the drafters of the new law will take this opportunity to ensure its approximation with the requirements of the Convention.

43. The Committee also finds that by failing to provide for public participation in decision-making processes for the designation of land use, the Government of Armenia was not in compliance with article 7 of the Convention.

44. The Committee further finds that by failing to ensure that members of the public concerned had access to a review procedure and to provide adequate and effective remedies, the Government of Armenia was not in compliance with article 9, paragraphs 2–4, of the Convention.

B. Recommendations

45. Noting that the Party concerned has agreed that the Committee take the measure referred to in paragraph 37 (b) of the annex to decision I/7, the Committee, pursuant to paragraph 36 (b) of the annex to decision I/7, recommends that Armenia:

(a) undertake practical and legislative measures to overcome the existing problems with access to environmental information, including, where appropriate, statistical monitoring of processing information requests;
(b) ensure practical application of public participation procedures at all levels of decision-making in accordance with article 7 of the Convention and relevant domestic legislation;
(c) develop detailed procedures for public participation in decision-making on activities referred to in article 6, paragraph 1, of the Convention, *inter alia* by incorporating them into the new Law on Environmental Impact Assessment, and to ensure their practical application, including by providing training to officials of all the relevant public authorities at various levels of administration;
(d) ensure that appropriate forms of decisions are used in decision-making on matters subject to articles 6 and 7, so as to ensure that the public can effectively exercise their rights under the Convention;
(e) undertake appropriate practical measures to ensure effective access to justice, including the availability of adequate and effective remedies to challenge the legality of decisions on matters regulated by articles 6 and 7 of the Convention;
(f) take the consideration and evaluation of the Committee into account in the ongoing revision of legislation referred to in paragraphs 4, 39 and 42 above as well as in further consideration of the specific matter raised by the communicants; and
(g) take the findings and conclusions of the Committee into account in further consideration of the specific matter raised by the communicants.

46. The Committee invites the Party concerned to provide information to the Committee, no less than six months before the third meeting of the Parties, on the measures taken and the results achieved in implementation of the above recommendations.

47. The Committee requests the secretariat, and invites relevant international and regional organizations and financial institutions, to provide advice and assistance to Armenia as necessary in the implementation of the measures referred to in paragraph 45.

48. The Committee resolves to review the matter no later than three months before the third meeting of the Parties and to decide what recommendations, if any, to make to the Meeting of the Parties, taking into account all relevant information received in the meantime.

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Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters

Compliance Committee

Forty-fifth meeting
Maastricht, the Netherlands, 29 June–2 July 2014
Item 7 of the provisional agenda
Communications from members of the public

Findings and recommendations with regard to communication ACCC/C/2008/31 concerning compliance by Germany*

Adopted by the Compliance Committee on 20 December 2013

Contents

* This document is a late submission owing to editorial and secretariat capacity constraints and the need to give priority to the processing of documents for the fifth session of the Meeting of the Parties (Maastricht, the Netherlands, 30 June and 1 July 2014).

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I. Introduction

1. On 1 December 2008, the non-governmental organization (NGO) ClientEarth, supported by the NGO Nature and Biodiversity Conservation Union (*Naturschutzbund Deutschland*), (collectively, the communicant), submitted a communication to the Compliance Committee under the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) alleging that Germany failed to comply with the Convention's provisions on access to justice.[1]

2. Specifically, the communication alleges that the legislation of the Party concerned establishes criteria for standing for environmental NGOs which are narrower in scope than those set out in article 9, paragraph 2, of the Convention and also does not ensure that members of the public concerned may challenge the procedural legality of any decision subject to article 6, as required by article 9, paragraph 2.

3. In addition, the communication alleges that, by failing to provide environmental NGOs with the possibility to challenge acts and omissions of private persons and public authorities which contravene environmental law when the "impairment of rights" criterion is not satisfied, the Party concerned fails to comply with article 9, paragraph 3, in conjunction with article 9, paragraph 4, of the Convention.

4. At its twenty-second meeting (Geneva, 17–19 December 2008), the Committee determined on a preliminary basis that the communication was admissible.

5. Pursuant to paragraph 22 of the annex to decision I/7 of the Meeting of the Parties to the Convention, the communication was forwarded to the Party concerned on 24 December 2008. By letters of 16 January 2009, the Party concerned and the communicant were invited to address questions from the Committee.

6. By letter of 26 March 2009, the Party concerned suggested the case be postponed as its courts had recently referred a similar case (later known as the *Trianel* case)[2] to the Court of Justice of the European Union (CJEU) where it was currently under consideration.

7. At its twenty-third meeting (Geneva, 31 March–3 April 2009), the Committee decided to suspend the deadline for the Party concerned to respond to the communication until two months after CJEU had delivered its opinion and agreed to seek the communicant's view on that approach.

8. By letter of 11 May 2009, the communicant expressed its support for that decision. The Committee, using its electronic decision-making procedure, decided to defer the deadline and its decision was communicated to the parties by letter of 18 May 2009.

9. On 12 May 2011, CJEU issued its preliminary ruling in the *Trianel* case. Considering the two-year delay in the Committee's consideration of the communication, the Committee using its electronic decision-making procedure instructed the secretariat to invite the Party concerned to submit its response by 20 June 2011 (i.e., before the two-month deadline from the issuance of the judgment originally envisaged) so that formal discussions might take place at its thirty-third meeting (Geneva, 28–29 June 2011). By letter of 18 May 2011, the secretariat conveyed this message to the Party concerned.

[1] The communication and related documents are available from http://www.unece.org/env/pp/compliance/Compliancecommittee/31TableGermany.html.

[2] Case C-115/09, *Bund für Umwelt und Naturschutz Deutschland, Landesverband Nordrhein-Westfalen eV v. Bezirksregierung Arnsberg, Trianel Kohlekraftwerk Lünen (intervening)* [2011] ECR I-3673.

10. By letter of 20 May 2011, the Party concerned replied that the Government's assessment of the CJEU judgment would not be completed by the proposed deadline of 20 June 2011.

11. At its thirty-third meeting, the Committee considered that it should await the decision of the German court after the preliminary CJEU ruling.

12. On 6 July 2011, the communicant submitted additional information and on 25 July 2011 the Party concerned responded to the communication.

13. On 13 December 2011, the communicant informed the Committee that the German court's decision had been issued.

14. On 27 February 2012, the Party concerned provided the decision of the regional Higher Administrative Court, Oberverwaltungsgericht für das Land Nordrhein-Westfalen, of 1 December 2011, together with a summary, both in German. On 26 March 2012, the Party concerned provided an English translation of parts of the decision and informed the Committee that, while the regional government had opted not to appeal that decision, the energy supply company involved (Trianel), had challenged the regional government's decision not to appeal, and the case was thus considered still pending at the domestic level.

15. At its thirty-sixth meeting (Geneva, 27–30 March 2012), the Committee provisionally scheduled to discuss the communication at its thirty-seventh meeting (Geneva, 26–29 June 2012). It instructed the secretariat to seek the parties' views on the impact on the communication of Trianel's challenge of the regional government's decision.

16. The communicant and the Party concerned provided their views on 23 and 26 April 2012, respectively. After taking into account their views, the Committee using its electronic decision-making procedure decided to discuss the communication at its thirty-eighth meeting (Geneva, 25–28 September 2012).

17. The Party concerned submitted additional information to the Committee on 20 August and 11 September 2012.

18. The Committee discussed the communication at its thirty-eighth meeting, with the participation of representatives of both parties. It confirmed the admissibility of the communication and put questions to the communicant and the Party concerned, inviting them to respond in writing after the meeting.

19. The communicant and the Party concerned submitted their responses on 29 October and 5 November 2012, respectively.

20. In view of the entry into force of amendments to the German Environmental Appeals Act, at the Committee's request, additional information was submitted by the Party concerned and the communicant on 19 February and 22 February 2013, respectively.

21. The Committee completed its draft findings at its forty-second meeting (Geneva, 24–27 September 2013). In accordance with paragraph 34 of the annex to decision I/7, the draft findings were forwarded to the parties on 11 November 2013 for their comments by 9 December 2013.

22. The Party concerned and the communicant provided comments on 6 and 7 December 2013, respectively.

23. At its forty-third meeting (Geneva, 17–20 December 2013), the Committee finalized its findings in closed session, taking account of the comments received. The Committee adopted its findings and agreed that they should be published as a formal pre-session document for its forty-fifth meeting. It requested the secretariat to send the findings to the Party concerned and the communicant.

II. Summary of facts, evidence and issues[3]

A. Legal framework

International treaties within the German legal order

24. When Germany becomes Party to an international treaty concerning matters regulated by federal legislation, the consent/participation of the federal legislature is required through the adoption of a law (Constitution (*Grundgesetz*), art. 59). The treaty is not directly applicable, unless it is deemed to be self-executing taking into account its wording, purpose and substance.

25. The Convention is not considered to be self-executing by the Party concerned and the Environmental Appeals Act (*Umwelt-Rechtsbehelfsgesetz*) (EAA) was adopted to implement article 9, paragraph 2.

26. However, after the preliminary CJEU ruling in the *Trianel* case, the Higher Administrative Court ruled that the provisions of article 9, paragraph 2, of the Convention have direct effect.

Standing of environmental NGOs in the review procedures relating to public participation under article 6 (art. 9, para. 2)

27. The rights of environmental NGOs to have access to review procedures relating to public participation under article 6 of the Convention are provided in the Rules on Administrative Court Procedures (*Verwaltungsgerichtsordnung*), section 42, complemented by the provisions of the EAA, sections 1–4.[4]

28. The Rules on Administrative Court Procedures, section 42, reads:

> (a) A claim can be made to request that an administrative act be quashed (*Anfechtungsklage*) or, where the administrative act had been refused or failed to be performed [by the public authority], that it be performed (*Verpflichtungsklage*).
>
> (b) Unless otherwise provided in other legislative provisions, a claim is only admissible where the claimant asserts that the administrative act, its refusal or omission has impaired the claimant's own rights.[5]

Criteria for NGO standing

29. The EAA[6] regulates the rights of associations[7] to have access to courts proceedings. It was amended in 2013, as a result, inter alia, of the preliminary CJEU ruling in the *Trianel* Case. According to section 2, paragraph 1, of the EAA, the association does not need to

[3] This section summarizes only the main facts, evidence and issues considered to be relevant to the question of compliance, as presented to and considered by the Committee.

[4] Law amending the provisions for environmental appeals in environmental matters, according to EC Directive 2003/35 (Gesetz über ergänzende Vorschriften zu Rechtsbehelfen in Umweltangelegenheiten nach der EG-Richtlinie 2003/35) as published on 8 April 2013 and last amended on 7 August 2013.

[5] Translation based on translations provided by the parties.

[6] English translation of the EAA was provided by the Party concerned on 19 February 2013 and the citations are mainly based on that translation.

[7] The EAA refers to the rights of "associations" ("Vereinigungen"). In keeping with the Convention, the present findings use the term "NGOs", except when citing from translations provided by the parties.

claim that its rights have been impaired (as required by the Rules on Administrative Court Procedures, section 42), but may file an appeal against a decision or the failure to take a decision, as defined in EAA, section 1, paragraph 1, if the association:

(a) Asserts that the decision/omission violates legal provisions which protect the environment (*"dem Umweltschutz dienen"*) and could be of importance for the decision ("*für die Entscheidung von Bedeutung sein können*");

(b) Asserts that promotion of the objectives of environmental protection according to its field of activity, defined in its by-laws, is affected by the decision/omission;

(c) Was entitled to participate in the process which led to the decision/omission and did so, according to applicable law; or, contrary to applicable law, was refused the right to participate.

30. EAA section 2, paragraph 5, provides that a claim by an association is justified if the administrative decision/omission contradicts legal provisions which protect the environment (*"dem Umweltschutz dienen"*) and are of importance for the decision/ omission ("*für die Entscheidung von Bedeutung sind*") and the violation involves issues of environmental protection that are among the objectives proposed by the association according to its by-laws.

31. EAA section 3 provides additional requirements for the recognition of associations for the purpose of filing an appeal under the EAA, including, inter alia, that environmental protection is among the association's objectives as set out in its by-laws, requirements as to membership and the length of time it has been in existence.

Scope of review

32. The Administrative Procedures Act (*Verwaltungsverfahrensgesetz*) (APA) provides that "the setting aside of an administrative act which is not void pursuant to section 44 cannot be claimed simply on the basis that in the course of its adoption provisions on procedure … were infringed where it is evident that the infringement did not affect the substantive decision" (sect. 46).[8]

33. According to German case law, the provision does not apply in cases of "fundamental errors of procedure", i.e., errors which regardless of the outcome of the procedure are deemed to be substantial. Where there are fundamental errors of procedure, the decision in question may be reversed. In this regard, the Federal Administrative Court (*Bundesverwaltungsgericht*) has held that as a rule a procedural error would lead to the annulment of a decision or the repetition of the failed procedural step if "in the circumstances of the case there is a real possibility" that the error had a bearing on the outcome of the decision (see Federal Administrative Court, judgment of 20 May 1998, case No. 11 C 3/97)).[9]

34. EAA section 4, paragraph 1, provides that the reversal of a decision on the admissibility of a project can be requested if an environmental impact assessment (EIA) or a preliminary assessment of the individual case concerning the requirement for an EIA required by law was not carried out and was not carried out in a later stage.

[8] Translation provided by the Party concerned in its response of 25 July 2011, pp. 9–10.
[9] Ibid.

35. The issue of a fundamental error of procedure has recently been before CJEU in the *Altrip* case.[10]

Review procedures for contraventions of environmental law by authorities/private persons (art. 9, para. 3)

36. The German Constitution (art. 17) provides for a right of petition, whereby every person has the right to address written requests or complaints to competent authorities and the legislature.

37. The administrative law of the Party concerned allows any person whose rights have been infringed to challenge the decision of an authority or its omission to take certain measures, including measures against third parties that have infringed provisions of environmental law. The appeal is considered by a hierarchically higher body. In the context of German administrative law, this type of procedure primarily aims to ensure the protection of individual interests, either exclusively or at least in parallel to the pursuit of general interest ("impairment of rights" doctrine ("*Schutznormtheorie*")). For instance, under anti-pollution law, such an action may be brought by individuals whose health may be affected by the activity of an industrial plant. Associations, including NGOs, have the right to use this avenue in some cases, such as under the Federal Nature Conservation Act (*Bundesnaturschutzgesetz*) and the Environmental Damage Act (*Umweltschadensgetz,* which implements the European Union (EU) Environmental Liability Directive),[11] as required further to relevant EU legislation, and to pursue the enforcement of general environmental laws through collective action in these areas.

38. Moreover, civil law provides for the right to initiate court proceedings against a third party in order to obtain injunctive relief and damages when the third party infringes a fundamental right of an individual in contravention of environmental law; and criminal law provides for the prosecution of several acts and omissions in contravention of environmental law (damage caused to the environment — water, soil, air, fauna and flora).

B. Substantive issues

39. The communicant alleges that the conditions for access to justice for environmental NGOs[12] laid down by German legislation are of a very restrictive nature, effectively deterring most environmental NGOs from exercising their rights under article 9, paragraphs 2 and 3 of the Convention. The Party concerned refutes all the allegations made.

[10] Case C-72/12, *Gemeinde Altrip and Others v. Land Rheinland-Pfalz* [2013], OJ C 204/6. The Federal Administrative Court made a preliminary reference to CJEU concerning Germany's implementation of the provisions of the EIA Directive on access to justice. Specifically, the Court asked whether the obligation to carry out a substantive and procedural review of a decision would require that a decision based on an incorrect EIA can be challenged; and also if it is compliant with European Union law that an EIA decision can only be reversed if the error affects subjective rights of the applicant and if without the error the decision would have been different. CJEU delivered its judgment on 7 November 2013, ruling that it must be possible for members of the public to challenge a permit on the ground that the EIA was incorrect; and that national courts can refuse to reverse the decision if it is proven that the decision would not have been different if there was not the procedural error invoked by the applicant. However, the evidence in that respect must be brought by the developer or the authority, or it must be evident from the files; the burden of proof must not be on the applicant.

[11] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage.

[12] "Associations" under German legislation, encompassing NGOs, see footnote 7 above.

The allegations and the Party concerned's response are summarized in the following paragraphs.

Review procedures relating to public participation under article 6 (art. 9, para. 2, in conjunction with art. 2, para. 5): standing and scope of review

40. The communicant claims that the rights of environmental NGOs to request a review of a decision, act or omission subject to article 6 of the Convention are restricted because of standing requirements and the limited scope of review, which have a significant deterrent effect. In its communication, the communicant raises four aspects of concern[13] (see subsections (a)-(d) below) which, taken separately and in a cumulative manner, mean that the Party concerned fails to comply with article 9, paragraph 2, of the Convention.

41. The communicant also claims that, since the Party concerned does not have a common law system (for instance, the case law on "fundamental errors of procedure" is not absolutely binding on the courts), to ensure legal certainty it is important to transpose the Convention in a way that keeps national law close to the text of the Convention.

42. The Party concerned stresses that the purpose of the wording in article 9, paragraph 2, and the intention of the Parties, was to leave discretion to each Party to decide how to implement the provision "within the framework of its national legislation", without compromising the objective of the Convention. Therefore, in addressing the communicant's allegations, it is important to keep the right balance between the substantive elements of the Convention and the discretion left to the Party for implementation.

43. The Party concerned also argues that, while according to the Constitution judges are independent and subject only to legislation, for reasons of legal certainty there is some uniformity in court jurisprudence, especially when there is a higher court judgement on a specific issue.

(a) Requirement for an NGO applicant to assert that the challenged decision affects its objectives, as defined in its by-laws

44. According to the communicant, the requirement that an NGO applicant has to assert that the challenged decision, act or omission under article 6 affects the objectives of environmental protection as defined by its by-laws (EAA section 2, para. 1.2, and section 2, para. 5), creates an additional burden on NGOs to demonstrate that their interests are affected in a specific case, and therefore the Party concerned is not in compliance with article 9, paragraph 2, of the Convention. It may, for instance, be very difficult for an NGO specializing in transport and environmental matters, to argue that the development of a power plant affects its purposes as defined in its by-laws. The requirements for NGOs set in EAA section 3 (see para. 31 above) are sufficient for the purposes of article 2, paragraph 5, of the Convention.

45. In contrast, the Party concerned contends that the requirement in question is a "requirement under national law" according to article 2, paragraph 5, and within the spirit and purpose of that provision. The Party concerned explains that the general requirements

[13] The original communication included an additional allegation that NGOs could access review procedures under article 9, paragraph 2, of the Convention only if they could prove that an individual whose personal rights had been impaired could also bring that claim (EAA, before the April 2013 amendment, s. 2, para. 1.1 and s. 2, para. 5, in conjunction with Rules of Administrative Court Procedures, s. 42, para. 2). Further to the preliminary ruling of CJEU in C-115/09 and the amendment to the EAA (on 21 January 2013, in force since April 2013), the communicant agreed that this allegation was no longer relevant.

in EAA section 3 lay down a standard and objective recognition procedure for NGOs, while the assessment under EAA section 2, paragraph 1.2, is carried out by courts on a case-by-case basis and aims to ensure that the public interest is represented as competently as possible while minimizing the risk that the rights for filing an application are abused. For instance, an environmental NGO specializing in coastal conservation cannot be a competent representative of the public interest in a case concerning an inland disposal installation. All these requirements, according to the Party concerned, are in line with article 2, paragraph 5, which grants Parties the discretion to define requirements for NGOs to have access to a review procedure under article 9, paragraph 2.

(b) The Convention's requirement for the review of the "substantive and procedural legality of any decision" not transposed into German law

46. The communicant alleges that the Party concerned has not clearly transposed into national law the Convention's obligation that members of the public concerned have the possibility to request both the procedural and substantive review of decisions, acts and omissions subject to article 6. The communicant submits that, in such a situation, it is up to the Party to submit evidence that, nevertheless, its national administrative and judicial practice is in compliance with the Convention.

47. The Party concerned contends that the communicant's allegation is unfounded and flawed, because EAA section 2, paragraph 1, subjects decisions under article 6 of the Convention to a review procedure as a whole, including a review of procedural and substantive legality. The Party concerned adds that article 9, paragraph 2, of the Convention does not require Parties to ensure that every procedural error automatically results in the reversal of a decision subject to article 6 (see further below); moreover, in implementing the Convention Parties do not have to stick to its exact wording.

(c) Requirement to assert that the challenged decision violates legal provisions "serving the environment"

48. The communicant alleges that because a review may be requested only with respect to legal provisions which promote the protection of the environment (EAA sect. 2, para. 1.1, "*dem Umweltschutz dienen*"), the Party concerned, in implementing article 9, paragraph 2, applies a narrow approach and adds requirements that are not in compliance with that provision of the Convention.

49. The Party concerned contends that the communicant's argument is based on an incorrect understanding of the law. It explains that the EAA provision in question does not restrict the ambit of decisions under article 6 of the Convention which may be challenged and that legal provisions "serving the environment" (*"dem Umweltschutz dienen"*) are not limited to environmental legislation in a strict sense, but include all legislation relating to the environment. Moreover, there appears to be no case where an action brought by an environmental NGO was not admissible for that reason. In general, however, it is in line with the Convention if the applicant can only challenge the aspects of the decision which concern, directly or indirectly, environmental matters.

(d) Requirement to assert that the challenged decision violates legal provisions which could be of importance for the decision; and review of procedural errors

50. The communicant alleges that because of the requirement that a review may be requested only if the decision violates legal provisions that could be of importance for the decision ("*für die Entscheidung von Bedeutung sein können*", EAA sect. 2, para. 1.1), the Party concerned, in implementing article 9, paragraph 2, applies a narrow approach and adds requirements that are not in compliance with that provision of the Convention. This is important namely with respect to review of the procedural legality of decisions. According

to the jurisprudence of the Federal Administrative Court (see para. 33 above), in relation to projects subject to EIA, procedural errors are only relevant when there is a concrete possibility that the decision concerning the project would have been different if the procedural error had not occurred and the onus is on the applicant to prove that the decision would have been different without the procedural error. This means that if the permit for a project was issued without the EIA required by law, this procedural error is irrelevant unless the applicant NGO proves that the decision would have been different had an EIA been properly carried out. The communicant submits that EAA section 4, paragraph 1, only partly addresses the issue, because the burden of proof still rests with the applicant.

51. The Party concerned refutes the communicant's allegations. It explains that the principle in APA section 46 (see para. 32 above) is a measure of procedural economy to ensure that a decision is not reversed for a mere infringement of a formality as long as the outcome is correct. The principle does not apply to so-called "fundamental errors of procedure" (see para. 33). According to the Party concerned, a failure to comply with any of the public participation elements of article 6 of the Convention should be considered as a fundamental error of procedure that would lead to the annulment of the decision (see EAA sect. 4, which is a *lex specialis* against the general rule of APA sect. 46).[14] The Party claims that its approach is therefore in compliance with article 9, paragraph 2, of the Convention, which accords discretion to a Party in the framework of its national legislation to set certain conditions, such as the intensity of the judicial review and the consequences in the event of infringement. The Party concerned also, in this respect, refers to the CJEU judgment in the *Altrip* case (see footnote 10 above), which proves that the German law system is "in principle" in conformity with EU law transposing the Convention.

52. The Party concerned also argues that the objective of EAA section 2, paragraph 1.1, and section 2, paragraph 5.1 — i.e., the requirement for contravention of legal provisions that protect the environment ("*dem Umweltschutz dienen*") and that are of importance for the decision ("*für die Entscheidung von Bedeutung sind*") — is to exclude applications for infringement of provisions that are not relevant for the decision. This, according to the Party concerned, is within the limits of discretion for implementation granted by article 9, paragraph 2, of the Convention, and the communicant's allegation is therefore unfounded. The Party concerned also provides examples of recent court jurisprudence,[15] delivered after CJEU issued its preliminary ruling on the *Trianel* case, to show that both article 11 (former art. 10a) of the EIA Directive[16] and article 9, paragraph 2, of the Convention have direct effect in German law. The Party concerned contends that that means, inter alia, that the Convention supplements EAA section 2, paragraphs 1 and 5, and the applicant is entitled to assert a violation of any provision of German law related to the environment.

(e) EAA 2013 amendments

53. Subsequent to its original communication, the communicant alleges that the 2013 amendments to the EAA introduce new impediments for NGOs to get access to justice, such as a six-week limit for indicating the facts and evidence to justify their appeal and limitations to the scope of judicial review of the discretionary powers of administrative authorities in environmental matters.

[14] See also Higher Administrative Court of Rheinland-Pfalz judgment of 25 January 2005, case No. 7 B 12114/04.

[15] See letter of 5 November 2012.

[16] Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment, as amended.

NGO standing to challenge acts and omissions of private persons and public authorities (art. 9, para. 3, in conjunction with para. 4)

54. The communicant alleges that, beyond the scope of article 9, paragraph 2, of the Convention, environmental NGOs cannot seek review of acts and omissions of private persons and public authorities that contravene German environmental laws unless the rights of the NGO itself have been impaired ("impairment of rights" doctrine ("*Schutznormtheorie*")). The Party concerned has not introduced any amendments to its legislation since the ratification of the Convention and the situation is not compatible with the general objective of the Convention to give the public, including environmental organizations, wide access to justice. In this context, the communicant refers also to the requirement in article 9, paragraph 4, of the Convention for procedures to be effective, fair, equitable, timely and not prohibitively expensive. In support of its allegations, the communicant presents recent case law to the effect that an NGO may not challenge a permit if no EIA is required by law, such as for the construction and operation of a windmill.[17]

55. The Party concerned contends that the communicant's allegation is unjustified and misinterprets the requirements of article 9, paragraph 3, of the Convention. It argues that German law ensures effective legal protection for the public in the field of environmental protection as required by article 9, paragraphs 3 and 4, and that rules set according to the impairment of rights theory, a well-enshrined theory in German legal tradition, are within the discretion conferred upon the Party to implement the Convention. This is clear from the language of the provision, i.e., "where they meet the criteria, if any, laid down in its national law" and that Parties "shall ensure", which means that if Parties have in place laws that already ensure the minimum standards to access to review procedures, there is no need for further amendment.

56. The Party concerned recalls that, unlike paragraph 2 of article 9, paragraph 3 refers to the "public" and not "the public concerned". Therefore, the privilege granted to environmental NGOs according to article 2, paragraph 5, does not apply. Moreover, under German law environmental NGOs have access to review procedures in the area of nature conservation[18] and environmental liability.[19]

57. The Party concerned also recalls that article 9, paragraph 3, provides for access to administrative "or" judicial procedures. Therefore, in assessing alleged non-compliance with this provision, the availability of administrative procedures may suffice. The Party concerned argues that it has a coherent and effective set of administrative, civil and criminal law rules that allow an individual or an association, including an NGO, to pursue the observance of environment-related provisions and to challenge any infringement of those provisions by an authority or private person.

58. In support of its argument, the Party concerned refers to decision II/2 of the Meeting of the Parties on promoting effective access to justice,[20] to previous jurisprudence of the Committee (e.g., the findings on communications ACCC/C/2005/11 (Belgium) (ECE/MP.PP/C.1/2006/4/Add.2) and ACCC/C/2008/32 (EU) (Part I) (ECE/MP.PP/C.1/2011/4/Add.1)), and in particular to German case law showing that courts increasingly opt for a wide interpretation of the impairment of rights theory. For instance, in a 2009 case, the Federal Constitutional Court (*Bundesverfassunsgericht*)[21] ruled that the legal provisions concerning the issue of a permit for the transport of nuclear fuel intended

[17] Communicant's submissions of 22 February 2013.
[18] Federal Nature Conservation Act.
[19] Environmental Damage Act.
[20] ECE/MP.PP/2005/2/Add.3.
[21] Case No. 1 BvR 2524/06 of 29 January 2009.

to protect as "third parties" also those living close to the transport route. This overturned earlier jurisprudence relating to anti-pollution laws, which had defined as "third parties" only those exposed to a certain pollutant. In addition, CJEU, in a ruling on the preliminary reference by the Federal Administrative Court in the *Janecek* case,[22] confirmed the entitlement of an individual to require an air quality plan to be drawn up in the event that established thresholds were exceeded. The Party concerned referred to a decision of the Federal Administrative Court of 5 September 2013[23] to show that German law can be interpreted in compliance with the requirements of article 9, paragraph 3, of the Convention. In that decision the Court adopted a broad interpretation of the term "impairment of the subjective right" with respect to environmental NGOs, stating that NGOs will be affected in their subjective rights by the issuing of the air quality plans, as they have "the right to demand compliance with the imperative provisions of the law on ambient air quality".

59. For all the above reasons, the Party concerned contends that it does not fail to comply with article 9, paragraph 3.

60. With regard to article 9, paragraph 4, of the Convention, the Party concerned contends that its law satisfies all the requirements of that provision. It maintains that the Rules of Procedure of the Administrative Courts and the Rules of Procedure of Civil Courts (*Zivilprozessordnung*) ensure effective legal protection: if the appeal is well founded, then the authority will be required to reconsider the matter and court decisions are enforced by means of enforcement orders.

III. Consideration and evaluation by the Committee

61. Germany ratified the Convention on 15 January 2007. The Convention entered into force for Germany on 15 April 2007.

62. The communicant, in alleging deficiencies in the relevant legislation of the Party concerned with respect to the requirements of article 9, paragraphs 2, 3 and 4, of the Convention, stresses that these deficiencies, both separately and in their cumulative effect, form a sufficient basis to conclude that the Party concerned fails to comply with the Convention. This, according to the communicant, cannot be outweighed by possible different court interpretations of the provisions in question.

63. The general argument of the Party concerned is that all the provisions of its legislation contested by the communicant can be — and indeed are — interpreted and applied in compliance with the Convention in practice. The Party concerned considers it has provided the Committee with a number of court decisions supporting this argument and proving that German courts are ready to apply article 9 of the Convention directly if needed.

64. As already noted in its findings on previous communications, when evaluating compliance with article 9 of the Convention, the Committee pays attention to the general picture regarding access to justice in the Party concerned, in the light of the purpose reflected in the preamble of the Convention that "effective judicial mechanisms should be accessible to the public, including organizations, so that its legitimate interests are protected and the law is enforced" (see findings on communications ACCC/C/2006/18 (Denmark) (ECE/MP.PP/2008/5/Add.4), para. 30, and ACCC/C/2011/58 (Bulgaria) (ECE/MP.PP/C.1/2013/4), para. 52). The "general picture" includes both the legislative

[22] Case C-237/07, *Dieter Janecek v. Freistaat Bayern* [2008] ECR I-6221.

[23] Case BVerwG 7 C 21.12.

framework of the Party concerned concerning access to justice in environmental matters, and its application in practice by the courts. Moreover, the fact that an international agreement may be applied directly and prior to national law should not be taken as an excuse by the Party concerned for not transposing the Convention through a clear, transparent and consistent framework (see findings on communication ACCC/C/2006/17 (EU) (ECE/MP.PP/C.1/2008/5/Add.10), para. 58).

65. Consequently, when assessing compliance with article 9 of the Convention, the Committee does not only examine whether the Party concerned has literally transposed the wording of the Convention into national legislation, but also considers practice, as shown through relevant case law. The mere hypothesis that courts could interpret the relevant national provisions contrary to the Convention's requirement is not sufficient to establish non-compliance by the Party concerned. If the relevant national provisions can be interpreted in compliance with the Convention's requirements, the Committee considers whether the evidence submitted to it demonstrates that the practice of the courts of the Party concerned indeed follows this approach. If it does not, the Committee may conclude that the Party concerned fails to comply with the Convention.

66. In this context, the Committee notes that EU legislation constitutes a part of the national law of EU member States (see findings on communication ACCC/C/2006/18 (Denmark), para. 27).

67. Where the wording of national legislation appears to contradict the requirements of the Convention, the Committee still considers the case law submitted to it in order to determine whether the line of interpretation by courts or other national authorities nevertheless meets the requirements of the Convention. Under such circumstances, the Committee may conclude that the Party concerned does not fail to comply with the Convention notwithstanding the wording of the national legislation.

68. Based on these general principles, the Committee considers the specific allegations raised by the communicant and the responses of the Party concerned. The Committee does not consider the allegation that in the context of article 9, paragraph 2, NGOs can request review only with respect to legal provisions that establish personal rights for individuals, since the communicant and the Party concerned have agreed that this issue has been resolved by the CJEU decision in *Trianel*, subsequently reflected in the case law of the German courts and by the 2013 amendment of the EAA. The Committee further decides not to deal with the allegations concerning the new requirements introduced by the 2013 EAA amendment with regard to judicial review in environmental matters. Without any practical examples of how these new EAA provisions are applied by the courts, the Committee is not in a position to examine their compliance with the Convention.

Standing of environmental NGOs in review procedures relating to public participation under article 6 (art. 9, para. 2)

69. As summarized above (paras. 40–53), the communicant alleges that a number of the standing conditions stipulated by the EAA for environmental NGOs to have access to review procedures to challenge decisions, acts and omissions subject to article 6 of the Convention do not comply with article 9, paragraph 2, of the Convention. The Committee evaluates the provisions contested by the communicant, one by one, on the basis of the general principles mentioned in paragraphs 64–67 above.

(a) Requirement for environmental NGOs to assert that the challenged decision affects their objectives, as defined in their by-laws

70. The communicant claims that the EAA condition that an environmental NGO must assert that promotion of the objectives of environmental protection in accordance with its

field of activity, as defined in its by-laws, is affected by the challenged decision is not in compliance with the Convention. According to the communicant, all environmental NGOs meeting the general conditions of EAA section 3 should have access to review procedures without further restrictions. The Party concerned claims that this condition does not infringe article 9, paragraph 2, of the Convention, because it constitutes a reasonable and legitimate "requirement under national law" according to article 2, paragraph 5, of the Convention.

71. It follows from article 2, paragraph 5, that NGOs "promoting environmental protection" shall be deemed to have an interest in environmental decision-making. According to article 9, paragraph 2, of the Convention, any NGO meeting the requirements referred to in article 2, paragraph 5, should be deemed to have sufficient interest and thus granted standing in the review procedure. Hence, a criterion in national law that NGOs, to have standing for judicial review, must promote the protection of the environment is not inconsistent with the Convention per se. However, in order to be in accordance with the spirit and principles of the Convention, such requirements should be decided and applied "with the objective of giving the public concerned wide access to justice" (see findings on communications ACCC/C/2006/11 (Belgium) (ECE/MP.PP/C.1/2006/4/Add.2), para. 27, and ACCC/C/2009/43 (Armenia) (ECE/MP.PP/2011/11/Add.1), para. 81). This means that any requirements introduced by a Party should be clearly defined, should not cause excessive burden on environmental NGOs and should not be applied in a manner that significantly restricts access to justice for such NGOs.

72. The criterion in the law of the Party concerned that environmental NGOs must demonstrate that their objectives are affected by the challenged decision amounts to a "requirement under national law", as set out in article 2, paragraph 5, of the Convention. The criterion is sufficiently clear and does not seem to put an excessive burden on environmental NGOs, since this can be easily proven by the objectives stated in its by-laws. Moreover, NGOs have the possibility to (re-)formulate their objectives from time to time as they see fit. No information was submitted to the Committee to show that the authorities and courts of the Party concerned use this criterion in such a manner so as to effectively bar environmental NGOs from access to justice.

73. Since the application of this requirement by the Party concerned does not seem to contravene the objective of giving the public concerned wide access to justice, the Party concerned does not fail to comply with article 9, paragraph 2, of the Convention in this respect.

(b) Convention's requirement for the review of the "substantive and procedural legality of any decision" not transposed into German law

74. The communicant asserts that since there is no explicit transposition into German law of the Convention's requirement that members of the public concerned shall have the right to challenge both the substantive and procedural legality of any decision, act or omission subject to article 6 of the Convention, the Party concerned is in non-compliance with article 9, paragraph 2, of the Convention. The Party concerned argues that it is possible for members of the public concerned to challenge both the substantive and procedural legality of decisions under the EAA, and also that Parties are not obliged to transpose the exact wording of the Convention into national legislation.

75. The fact that the exact wording of any provision of the Convention has not been transposed into national legislation is in itself not sufficient to conclude that the Party concerned fails to comply with the Convention. The communicant's allegations concerning the impacts of the Party concerned not explicitly transposing the "substantive and procedural legality" requirement into German law have not been substantively corroborated by relevant practice. Therefore, the Committee does not conclude that the Party concerned fails to comply with article 9, paragraph 2, of the Convention in this respect.

(c) Requirement to assert that the challenged decision violates legal provisions "serving the environment"

76. The communicant argues that by limiting the scope of judicial review to alleged contraventions of statutory provisions "serving the environment" (*"dem Umweltschutz dienen"*), the EAA imposes a limitation not found in article 9, paragraph 2, of the Convention, thus narrowing the range of administrative decisions that can be challenged by members of the public concerned. The communicant adds that in many cases it may be questionable whether a provision "serves the environment" or not and this may lead to unacceptable uncertainty as to whether the conditions for standing are met. According to the Party concerned, the decisions subject to judicial review under the EAA are clearly defined in EAA section 1 and are not limited by the requirement in question. Moreover, the Party concerned asserts that restricting the scope of judicial review to alleged infringements of legal provisions "serving the environment" would be in compliance with the Convention in any event, taking into account the Convention's objective and focus on environmental decision-making. There is also no indication that this condition would in any way limit access to courts in practice.

77. As mentioned above, the Party concerned is not obliged to literally transpose the text of the Convention into its national legislation. However, when using its discretion in designing its national law, the Party concerned should not impose additional requirements that restrict the way the public may realize the rights awarded by the Convention, if there is no legal basis in the Convention for imposing such restrictions.

78. Article 9, paragraph 2, requires each Party to ensure access to review procedures in relation to any decision, act or omission subject to article 6 of the Convention. The range of subjects who can challenge such decisions may be defined (limited) by the Party in accordance with the provisions of article 2, paragraph 5, and article 9, paragraph 2 (a) and (b), of the Convention. However, the Party may not through its legislation or practice add further criteria that restrict access to the review procedure, for example by limiting the scope of arguments which the applicant can use to challenge the decision.[24] While the Convention relates to environmental matters, there may be legal provisions that do not promote protection of the environment, which can be violated when a decision under article 6 of the Convention is adopted, for instance, provisions concerning conditions for building and construction, economic aspects of investments, trade, finance, public procurement rules, etc. Therefore, review procedures according to article 9, paragraph 2, of the Convention should not be restricted to alleged violations of national law "serving the environment", "relating to the environment" or "promoting the protection of the environment", as there is no legal basis for such limitation in the Convention.

79. When there is a clear contradiction between the provisions of national law and the requirements of the Convention, as in the present case, it is for the Party concerned to bring evidence to show that its courts interpret those provisions in conformity with the Convention (see para. 67). However, this has not been shown by the Party concerned with respect to the requirement of "serving the environment". The Party concerned, in its comments on the draft findings, referred to a number of court decisions that it claimed showed that the term "serving the environment" is interpreted in a broad manner. These cases show that the courts include, for example, protection of human health or flood protection in their considerations. These issues are, however, within the scope of what

[24] Similarly CJEU in the *Altrip* case, para. 36, said: "In providing that the decisions, acts, or omissions referred to therein must be actionable before a court of law through a review procedure to challenge their substantive or procedural legality, the first paragraph of Article 10a of Directive 85/337 has in no way restricted the pleas that may be put forward in support of such an action."

relates to the environment. The Committee is thus not convinced that these cases show that issues other than those relating to environmental concerns can be successfully raised under the clause "serving the environment".

80. For these reasons, the Committee finds that by imposing a requirement that an environmental NGO to be able to file an appeal under the EAA must assert that the challenged decision contravenes a legal provision "serving the environment" (*dem Umweltschutz dienen*), the Party concerned fails to comply with article 9, paragraph 2, of the Convention.

(d) Requirement to assert that the challenged decision violates legal provisions which could be of importance for the decision; and review of procedural errors

81. The communicant alleges that the EAA requirements that the environmental NGO must assert that the contested decision contravenes a legal provision which "could be of importance" for the decision ("*für die Entscheidung von Bedeutung sein können"*) and that the appeal can be justified only if the court finds that legal provisions contravened "are of importance" for the decision ("*für die Entscheidung von Bedeutung sind*"), imply a limitation which is contrary to article 9, paragraph 2, of the Convention. In particular, the communicant points out that the application of these requirements considerably limits the possibility for environmental NGOs to challenge the procedural legality of decisions issued under the EAA. The Party concerned argues that, in general, the fact that only alleged violations of provisions which could be relevant for the decision are considered by the courts is not contrary to the Convention. It argues that according to German law, the substantive legality of a decision by a public authority is subject to a complete review by the court, while procedural errors are of secondary importance. According to the Party concerned, the possibility for the court to assess whether a procedural error could influence the substantive legality of the decision, and to cancel the decision only if the answer is affirmative, is in compliance with the Convention. It also emphasizes that the alleged violations of essential procedural rights granted by article 6 of the Convention are considered by the German courts as "fundamental errors of procedure", with respect to which the possibility to review and cancel the decision is ensured.

82. The Committee recalls that article 9, paragraph 2, of the Convention is directly linked to article 6, which grants the rights of the public concerned to participate in permitting procedures for specific activities. The Parties must ensure that in such procedures, members of the public concerned can fully exercise their participatory procedural rights set out in article 6 of the Convention.

83. Article 9, paragraph 2, in conjunction with article 9, paragraph 4, of the Convention requires Parties to provide members of the public concerned with access to effective judicial protection should their procedural rights under article 6 be violated. Therefore, it would not be compatible with the Convention to allow members of the public to challenge the procedural legality of the decisions subject to article 6 of the Convention in theory, while such actions were systematically refused by the courts in practice, as either not admissible or not well founded, on the grounds that the alleged procedural errors were not of importance for the decisions (i.e., that the decision would not have been different, if the procedural error had not taken place).

84. On the basis of the above, the Committee examines the information provided by the communicant and the Party concerned as to whether the courts of the Party concerned systematically refuse review applications as non-admissible or ill-founded when the applicants allege that procedural rights under article 6 of the Convention have been infringed.

85. EAA section 2 does not establish any criteria for determining when a contravention of a legal provision could be "of importance" for a challenged decision. EAA section 4 specifies that the reversal of a decision can be requested if (a) an EIA, or (b) a preliminary assessment of a project concerning the requirement for an EIA, required in accordance with the EIA Act, was not carried out. The Committee notes that there is disagreement between the communicant and the Party concerned as to whether the errors listed in EAA section 4 "can" lead to reversal of the challenged decision, as the communicant asserts, or "must" have this effect, which is the position of the Party concerned.

86. Based on the information provided to it, the Committee understands that for its appeal to be admissible, an NGO must assert that the allegedly violated provision "could be" of importance for the contested decision, while to find an appeal justified, the court must conclude that the violated provisions "are" of importance for the decision.

87. The possibility for national courts to evaluate whether the allegedly infringed provisions could be of any importance for the merits of the case, is not, in general, contrary to the requirements of article 9, paragraph 2, and to the objectives of the Convention.[25] This possibility, as such, would not prevent environmental NGOs from challenging both substantive and procedural legality of the decisions.

88. The information provided by the communicant and the Party concerned relating to the scope of judicial review for alleged procedural errors raises doubts as to whether the legal system of the Party concerned ensures adequate access for environmental NGOs to review the procedural legality of the decisions subject to article 6 of the Convention. This is so namely because the question of the possible "importance of the provision for the contested decision" is, according to section 2, paragraph 1, of the EAA, considered by the court already when deliberating on the admissibility of the case, i.e., not in the full judicial review procedure.

89. The Party concerned has submitted relevant recent case law showing that German courts consider violations of procedural rights granted under article 6 of the Convention as fundamental errors of procedure that would require review and eventually annulment of the decision, and that courts are ready to apply the Convention directly in that respect ("direct effect of article 9, paragraph 2, of the Convention supplements the provisions of section 2, paragraphs 1 and 5, of the EAA").[26] The request for a preliminary ruling made by the Federal Administrative Court to CJEU in the *Altrip* case (see para 35 above) indicates that there may be uncertainty as to how German courts should deal with procedural errors concerning decisions subject to article 6 of the Convention. The communicant has not, however, sufficiently substantiated, e.g., by reference to recent case law, that the courts when applying the EAA in practice refuse to deal with appeals and/or arguments of environmental NGOs concerning alleged procedural errors with respect to decisions subject to article 6 of the Convention. Moreover, it follows from the CJEU ruling in *Altrip* that the German courts should take procedural errors into account in environmental cases. Therefore, the Committee does not conclude that the Party concerned fails to comply with article 9, paragraph 2, of the Convention with respect to the scope of judicial review regarding the procedural legality of decisions subject to article 6 of the Convention.

90. The Committee nevertheless raises a concern about the lack of clarity of the legal system of Party concerned as to whether a violation of the procedural rights prescribed under article 6 would be considered as a fundamental error of procedure to allow for fulfilment of the rights prescribed under article 9, paragraph 2, of the Convention. The

[25] CJEU comes to similar conclusions in the *Altrip* case, para. 57.

[26] Federal Administrative Court, Case No. 4 C 9/06, judgment of 13 December 2007.

Committee emphasizes that if German courts in practice were to deny review of the appeals and/or arguments of members of the public concerned, including environmental NGOs, regarding the procedural legality of decisions subject to article 6, this would amount to non-compliance with article 9, paragraph 2.

NGO standing to challenge acts and omissions of private persons and public authorities (art. 9, para. 3, in conjunction with para. 4)

91. The communicant alleges that, beyond the scope of the EAA, standing to challenge acts and omissions of private persons and public authorities which contravene provisions of environmental law is granted only to persons who claim that their own personal rights are injured. This applies also to environmental NGOs. Such a situation is, according to the communicant, not in compliance with the requirements of article 9, paragraph 3, in conjunction with paragraph 4, of the Convention. The Party concerned contends that the requirement in its legislation that a person has to claim that his or her own rights have been infringed when lodging an administrative appeal constitutes a legitimate criterion in line with article 9, paragraph 3, of the Convention. In addition, the Party concerned emphasizes that under its national law environmental NGOs have access to review procedures beyond the scope of the EAA, without having to assert an infringement of their own rights, in the areas of nature conservation. It also refers to the jurisprudence of national courts interpreting the "impairment of right" condition in a broad manner, namely, the recent judgment of the Federal Administrative Court of 5 September 2013,[27] which interpreted the term "impairment of the subjective right" broadly with regard to the possibility for environmental NGOs to challenge air quality plans (see para. 58 above).

92. Unlike article 9, paragraphs 1 and 2, article 9, paragraph 3, of the Convention applies to a broad range of acts or omissions and also confers greater discretion on Parties when implementing it. Yet, the criteria for standing, if any, laid down in national law according to this provision should always be consistent with the objective of the Convention to ensure wide access to justice. The Parties are not obliged to establish a system of popular action (*actio popularis*) in their national laws to the effect that anyone can challenge any decision, act or omission relating to the environment. On the other hand, the Parties may not take the clause "where they meet the criteria, if any, laid down in its national law" as an excuse for introducing or maintaining such strict criteria that they effectively bar all or almost all members of the public, including environmental NGOs, from challenging acts or omissions that contravene national law relating to the environment. Access to such procedures should be the presumption, not the exception, as article 9, paragraph 3, should be read in conjunction with articles 1 and 3 of the Convention and in the light of the purpose reflected in the preamble, that "effective judicial mechanisms should be accessible to the public, including organizations, so that its legitimate interests are protected and the law is enforced" (findings on communications ACCC/C/2005/11 (Belgium), paras. 34–36; ACCC/C/2006/18 (Denmark), paras. 29-30; and ACCC/C/2010/48 (Austria) (ECE/MP.PP/C.1/2012/4), paras. 68–70).

93. The Committee, when evaluating the compliance of the Party concerned with article 9, paragraph 3, of the Convention, considers the "general picture" described by the communicant and the Party concerned, i.e., both the relevant legislative framework and its application in practice (see para. 64 above). Therefore, the Committee takes into account whether national law effectively blocks access to justice for members of the public, including environmental NGOs, and considers if there are remedies available for them to actually challenge the act or omission in question.

[27] Case BVerwG 7 C 21.12.

94. Article 9, paragraph 3, does not distinguish between public or private interests or objective or subjective rights, and it is not limited to any such categories. Rather, article 9, paragraph 3, applies to contraventions of any provision of national law relating to the environment. While what is considered a public or private interest or an objective or subjective right may vary among Parties and jurisdictions, access to a review procedure must be provided for all contraventions of national law relating to the environment.

95. The Party concerned has adopted environmental laws at the federal level, and the *Länder* (states) have competence to implement and enforce that legislation. Access to justice in environmental matters is primarily regulated at the federal level. According to the well-enshrined principle in German procedural law derived from the "impairment of rights" doctrine ("*Schutznormtheorie*"), access to justice is granted on the basis of whether the applicant claims infringement of his/her subjective rights. A strict application of this principle in matters of access to justice under the Convention would imply non-compliance with article 9, paragraph 3, of the Convention, since many contraventions by public authorities and private persons would not be challengeable unless it could be proven that the contravention infringes a subjective right. The requirement of infringement of subjective rights would in many cases rule out the opportunity for environmental NGOs to access review procedures, since they engage in public interest litigation.

96. The Party concerned and the communicant agree that, apart from the rights of access to justice provided for in the EAA, which implements article 9, paragraph 2, of the Convention, the only other explicit legislative provisions which provide legal standing to environmental NGOs, are proceedings issued under the Federal Nature Conservation Act or the Environmental Damage Act. It follows that, apart from the rights on access to justice provided in the EAA, the Federal Nature Conservation Act and the Environmental Damage Act, there is no apparent basis in the legislation for access to review procedures for environmental NGOs.

97. The communicant provided examples of recent judgements where it claimed standing was denied to environmental NGOs.[28] The Party concerned disputed these examples, alleging that the lawsuits of the NGOs were admissible, but refused on the basis of not being well-founded. The Party concerned also presented the judgment of the Federal Administrative Court of 5 September 2013, in which legal standing was granted to an NGO, in the area of air protection, beyond the scope of the EAA, the Federal Nature Conservation Act and the Environmental Damage Act, with reference to article 9, paragraph 3, of the Aarhus Convention and relevant CJEU jurisprudence.

98. In its judgment of 5 September 2013, following the CJEU judgment in the "Slovak Brown Bear" case,[29] the Federal Administrative Court broadened the interpretation of the criterion of "impairment of a right". This, however, was done in order to ensure the correct implementation of the relevant EU legislation (see paras. 20–26 and 46 of the judgement of the Federal Administrative Court) and does not imply that the same interpretation will be applied by the courts to those areas of national law relevant to the Aarhus Convention but not covered by EU law. Nor does it guarantee that this interpretation will be widely followed in future decisions. The Federal Administrative Court itself has indicated that for Germany to be fully in compliance with the requirements of article 9, paragraph 3, of the Convention, changes in the legislation would be needed (see para. 32 of its judgement).

99. If the broad interpretation of the term "impairment of subjective rights" reflected in the judgment of the Federal Administrative Court of 5 September 2013 was to become a

[28] Oberverwaltungsgericht Nordrhein-Westfalen (case 2 B 940/12, decision of 29 August 2012); Verwaltungsgericht Kassel (case 4 L 81/12 ks, decision of 2 August 2012); Bayerische Verwaltungsgerichtshof (case 8 CS 12847, decision of 21 August 2012).

[29] Case C-240/09 *Lesoochranárske zoskupenie VLK v. Ministerstvo životného prostredia Slovenskej republiky* [2011] ECR I-1255.

general practice of German courts in all areas of national law relevant to the Convention, this could amount to compliance with article 9, paragraph 3. However, in the absence of legislative guarantees for members of the public, including environmental NGOs, to have access to review procedures to challenge acts and omissions of private persons and public authorities in areas of national environmental law beyond the scope of the EAA, the Federal Nature Conservation Act and the Environmental Damage Act, the Committee concludes that the conditions laid down by the Party concerned do not ensure standing to environmental NGOs to challenge acts or omissions that contravene national laws relating to the environment.

100. For these reasons, the Committee finds that, by not ensuring standing of environmental NGOs in many of its sectoral laws to challenge acts or omissions of public authorities or private persons which contravene provisions of national law relating to the environment, the Party concerned fails to comply with article 9, paragraph 3, of the Convention.

IV. Conclusions and recommendations

101. Having considered the above, the Committee adopts the findings and recommendations set out in the following paragraphs.

A. Main findings with regard to non-compliance

102. The Committee finds that:

(a) By imposing a requirement that an environmental NGO, to be able to file an appeal under the EAA, must assert that the challenged decision contravenes a legal provision "serving the environment", the Party concerned fails to comply with article 9, paragraph 2, of the Convention in this respect (para. 80).

(b) By not ensuring the standing of environmental NGOs in many of its sectoral laws to challenge acts or omissions of public authorities or private persons which contravene provisions of national law relating to the environment, the Party concerned fails to comply with article 9, paragraph 3, of the Convention (para. 100).

B. Recommendations

103. The Committee, pursuant to paragraph 35 of the annex to decision I/7 recommends the Meeting of the Parties, pursuant to paragraph 37 (b) of the annex to decision I/7, to recommend to the Party concerned that it take the necessary legislative, regulatory and administrative measures and practical arrangements to ensure that:

(a) NGOs promoting environmental protection can challenge both the substantive and procedural legality of any decision, act or omission subject to article 6 of the Convention, without having to assert that the challenged decision contravenes a legal provision "serving the environment";

(b) Criteria for the standing of NGOs promoting environmental protection to challenge acts or omissions by private persons or public authorities which contravene national law relating to the environment under article 9, paragraph 3, of the Convention are revised and specifically laid down in sectoral environmental laws, in addition to any existing criteria for NGO standing in the EAA, the Federal Nature Conservation Act and the Environmental Damage Act.

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Blood does not buy goodwill: allowing culling increases poaching of a large carnivore

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Quantifying environmental crime and the effectiveness of policy interventions is difficult because perpetrators typically conceal evidence. To prevent illegal uses of natural resources, such as poaching endangered species, governments have advocated granting policy flexibility to local authorities by liberalizing culling or hunting of large carnivores. We present the first quantitative evaluation of the hypothesis that liberalizing culling will reduce poaching and improve population status of an endangered carnivore. We show that allowing wolf (*Canis lupus*) culling was substantially more likely to increase poaching than reduce it. Replicated, quasi-experimental changes in wolf policies in Wisconsin and Michigan, USA, revealed that a repeated policy signal to allow state culling triggered repeated slowdowns in wolf population growth, irrespective of the policy implementation measured as the number of wolves killed. The most likely explanation for these slowdowns was poaching and alternative explanations found no support. When the government kills a protected species, the perceived value of each individual of that species may decline; so liberalizing wolf culling may have sent a negative message about the value of wolves or acceptability of poaching. Our results suggest that granting management flexibility for endangered species to address illegal behaviour may instead promote such behaviour.

1. Introduction

Most governments have a legal duty to conserve and restore endangered wild fauna and flora species [1] for the benefit of current and future generations [2]. The conservation of biodiversity can be controversial as it often imposes limits to human activities [3] and negative actions—such as environmental crimes—need to be contained at levels that do not preclude conservation successes. Evaluating the effectiveness of interventions aimed at abating environmental crimes has become fundamental to conservation policy making. For wildlife populations, environmental crimes include illegal hunting or poaching. However, while identifying the causes and extent of mortality is a central line of inquiry in biology and ecology, it remains notoriously difficult for poaching because evidence is typically concealed from enforcement agencies and scientists alike. As a consequence, illegal hunting or poaching has become a major cause of concern for the conservation of endangered species, particularly for controversial species such as large carnivores [4]. The few available quantitative studies have revealed strong effects of poaching on carnivore demography [5–7]. Poaching accounted for more mortality events than any other cause in the reintroduced populations of the red wolf *Canis rufus* [8] and more than half of the total mortality of Mexican grey wolves *C. lupus baileyi* [9]. In a unique, large but closed population, poaching accounted for half of the mortality of grey wolves in Scandinavia and two-thirds of poaching remained undetected using direct methods of observation [10]. Poaching has also significantly contributed to the extinction of a reintroduced brown bear (*Ursus arctos*) population

in Austria—the first modern time extinction of a large carnivore population in the European Union [11]—and the quasi-extinction of wolves in Southern Spain [12].

Quantifying the variation in poaching and especially how it responds to policy changes has become one of the most crucial questions for the conservation of large carnivores [6,13,14]. One proposal to address poaching of carnivores has been to legalize or liberalize killing. The difficulty of obtaining evidence about poaching has provided fertile ground for the notion that poachers will refrain if legal recourse exists, such as government-sponsored culling or regulated, public hunting [7,15,16]. In a review of conservation conflicts, Redpath *et al*. [17] argued that strict protections would need to be made more flexible to achieve more durable conservation outcomes. Woodroffe & Redpath [18] further insisted that 'Pragmatic conservationists have long recognized that allowing some predator control—whether or not it achieves its stated aims—can help to build tolerance among land managers who might otherwise block conservation efforts' albeit without providing any quantitative evidence. Despite this assumption remaining largely untested, or contrary predictions that legalizing killing stimulates intentions to poach [14], the notion has been promoted by several governments and management authorities, see e.g. Swedish Government Official Reports [19]. In 2007, the US Fish and Wildlife Service (FWS) proposed removing federal protections (delisting) for Yellowstone grizzly bears by claiming that 'a future hunting season also may increase tolerance and local acceptance of grizzly bears and reduce poaching in the GYA' [20]. It, however, later acknowledged in the final rule that 'there is no scientific literature documenting that delisting would or could build. . .tolerance for grizzly bears' but nevertheless maintained that 'effective nuisance bear management benefits the conservation of the Yellowstone grizzly bear population by . . . minimizing illegal killing of bears' [21]. Despite no additional scientific evidence being produced, the USFWS makes the same claims in 2016 in its new proposed rule to delist the Yellowstone grizzly bear [22] and argues that 'while lethal to the individual grizzly bears involved, these removals promote conservation of the GYE grizzly bear population by minimizing illegal killing of bears and promoting tolerance of grizzly bears'. Similar claims have been made in court for legalizing wolf culling. For example, the FWS asserted in a federal court that 'in the absence of adequate measures to control known depredating wolves, . . . individuals will resort to illegal killing' and the Swedish Ministry of the Environment replied to an infringement procedure by the European Commission that 'The Swedish Government and the Swedish Parliament considers that a [sic] limited and strictly controlled license hunting is needed to obtain local acceptance' of wolf conservation [23]. In winter 2015–2016, a wolf hunt in Finland (with a quota of 46 out of 250 wolves) was justified by Finnish authorities by the claim that 'The purpose of derogations granted to manage the population is to respond to the views put forward in the wolf territories and to develop a legal operating model of population management for dealing with disruptive individuals, and thus preventing illegal killing of wolves' [24]. The claim that legalizing culling or hunting will reduce poaching has become a fundamental issue for the conservation and management of large carnivores in human-dominated landscapes. It has often been discussed but never properly evaluated and is still made by authorities to justify substantial culling of recovering and still fragile populations. In this paper, we took advantage of replicated quasi-experimental changes in wolf policies in two US states (Wisconsin and Michigan, figure 1) to assess whether liberalizing culling of wolves changed wolf population dynamics from 1995 to 2012.

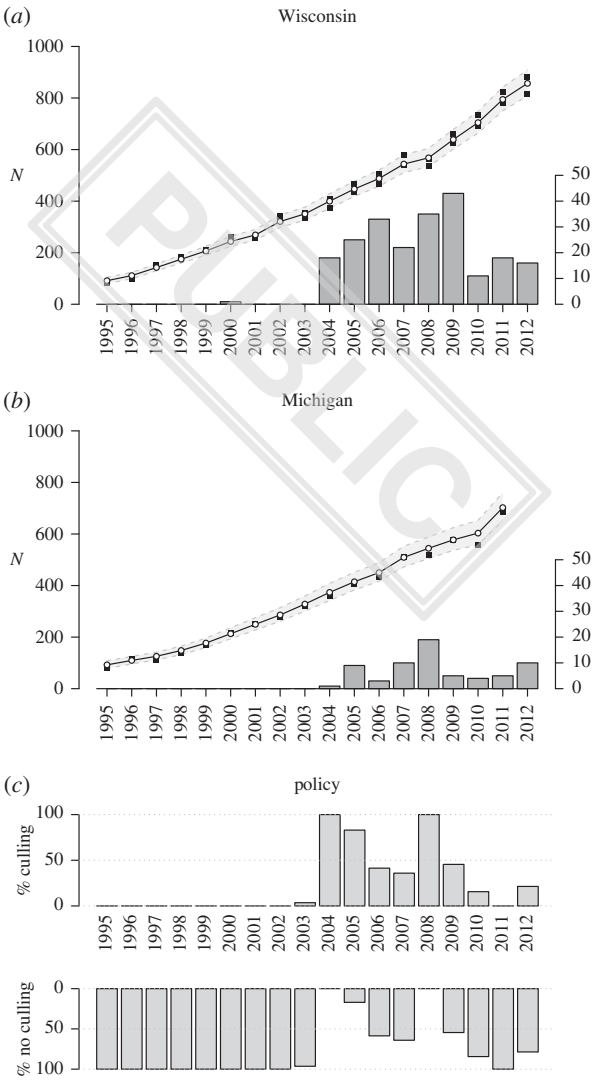

Figure 1. Wolf population history in Wisconsin (top) and Michigan (middle) and policies (bottom). The black squares are FWS population counts (scale on left axis, minimum and maximum for Wisconsin, minimum for Michigan), the grey area is the 95% credible interval of the fitted population model, the histogram shows the number of wolves culled (scale on right axis). The bottom panel shows the proportion of each year in which culling was allowed (or not). Some wolves were killed legally when culling was not allowed (e.g. year 2011) because the FWS allows killing individuals of an endangered species 'to protect himself or herself, a member of his or her family, or any other individual from bodily harm' (ESA §11(a)(3)).

2. Material and methods

The policy changes were replicated over six treatments in each state (when states had legal authority to cull) interspersed with six control periods (states did not have that authority following federal court decisions). Decisions to kill wolves by the two states were independent. We used a Bayesian hierarchical model to estimate variations in wolf population growth rates as a function of policy changes.

(a) Annual wolf population counts

Wolves were extirpated from both states in the 1950s, then recolonized Wisconsin by 1978 without direct human intervention,

probably from Minnesota [25]. Wolves recolonized Michigan by 1989, probably from Wisconsin [26]. From 1979 to April 2003, Wisconsin wolves were classified as federally endangered (listed) but the classification changed in the following years as we explain further below [15]. The Wisconsin population grew from 0 to a minimum of 815 by April 2012 and the Michigan population grew from 0 to 587 by April 2011 (no census was conducted in 2012). We defined a wolf-year t as starting 15 April of year $t-1$ and ending 14 April of year t. We obtained state wolf population estimates for each wolf-year 1995–2012 (minimum counts for Wisconsin and Michigan, maximum counts for Wisconsin) [27–29]. We obtained culling data and the variables used in density dependence from annual reports issued by Wisconsin (www.dnr.wi.gov (accessed September 2012) and through a memorandum of understanding with A.T., MoU MSN146937). We obtained data for Michigan from a state carcass tracking database accessed by the Little River Band of Ottawa Indians, which provided it to A.T., through a federal Consent Decree. The methods used for data collection were described previously [26,30].

(b) Wolves killed

To avoid bias resulting from censored or missing data, only the completely reported wolf mortality was treated as culling in our population model. Two circumstances increased our confidence in complete reporting of culling data. First, all culling was ordered or permitted to agents by the states of Wisconsin and Michigan. Second, by law, all wolf killing had to be reported by the government agencies during the study period [31]. We counted only those wolves killed by government-approved permits following verified or perceived threats to livestock, pets or human safety (the latter could occur during periods in which other culling was not allowed, electronic supplementary material, table S1). The signal associated with the onset of culling was far less ambiguous than that associated with delisting due to agency announcements and rule publications preceding the official date of delisting [15].

(c) Reproduction of packs

We estimated reproductive performance of packs using a binary variable (0 for no reproduction or 1 for reproduction). Estimates of reproductive performance of wolf packs were sometimes made *post hoc* after field observation of changes in pack size, sometimes from summer howling surveys that elicited pup responses, and sometimes from aerial radio-telemetry flights that included visual detection of young individuals in packs.

(d) Area occupied by wolf packs

For the wolf-years 2000–2011, we estimated total area occupied by wolf packs each year using the ArcGIS® spatial geometry calculator and polygon shapefiles from data provided by the WI DNR to A.T. under MoU MSN146937, which stipulated confidentiality of geographical locations of wolf packs.

(e) Management authority

On 1 April 2003, the FWS temporarily reclassified wolves as threatened (a lower level of protection under federal authority), which gave the states the authority under the Endangered Species Act (ESA) rule 4(d) to kill wolves implicated in verified damage to property (culling) [15]. In the ensuing years, federal courts and the FWS changed wolf classification to endangered (listed), removed federal protection (delisted), or separately gave the states sub-permits to cull wolves despite being listed as endangered (i.e. ESA 10(a)(1)(A) permits). Courts rescinded those sub-permits in both cases after variable intervals during which wolves were culled. As a result, the proportion of days in which culling was legally permitted under state authority was not equal to the proportion of days in which wolves were delisted. There were 12 treatment periods as a result of the policy changes (electronic supplementary material, table S1 and figure 1, bottom panel). Although the two states underwent nearly identical calendars of authority (electronic supplementary material, table S1), they managed wolves independently including independent contracts with federal Department of Agriculture (USDA) regional offices to cull wolves. There was no coordination of implementation between the two states [31], other than communicating the removal of radio-collared wolves that originated in the other state.

(f) Population-policy model

For each state S (Wisconsin or Michigan) at time t, the true population size N_t^S followed a lognormal distribution of the deterministic population size μ_t^S with a stochastic process error σ_{proc} on the log scale having a weakly informative prior (electronic supplementary material, table S2):

$$N_{t+1}^S \sim \text{Lognormal}(\mu_t^S, \sigma_{\text{proc}}).$$

The deterministic model was exponential and included the number of wolves culled H_t^S with a parameter γ allowing for compensation or depensation (super additivity) given an informative prior from North American data [32]

$$\mu_t^S = \log(N_t^S \cdot e^{r_t^S} - \gamma \cdot H_t^S).$$

Growth rate r_t^S was modelled as a linear function of the number of days that culling was allowed D_t^S in state S during year t (the policy signal):

$$r_t^S = \beta_0^{rS} + \beta_1^r \cdot D_t^S.$$

Coefficients of the linear function were parametrized with non-informative priors (electronic supplementary material, table S2).

We modelled the observed minimum counts of annual wolf population size Nobs_t^S by a Poisson distribution with a mean $o_{\text{MIN}} \cdot \psi_t^S$, with o_{MIN} having a non-informative prior on [0,1] to consider that a minimum count underestimates population size and ψ_t^S itself drawn from a Gamma distribution with mean equal to the prediction of the process model and a standard deviation σ_{Nobs}^S for observation error having a weakly informative prior:

$$\text{Nobs}_t^S \sim \text{Poisson}(o_{\text{MIN}} \cdot \psi_t^S),$$

$$\psi_t^S \sim \Gamma\left(\alpha_\psi = \left(\frac{N_t^S}{\sigma_{\text{Nobs}}^S}\right)^2, \beta_\psi = \frac{N_t^S}{(\sigma_{\text{Nobs}}^S)^2}\right).$$

We followed the same approach for the observed maximum counts in Wisconsin modelled by a Poisson distribution with a mean $o_{\text{MAX}} \cdot \psi_t^S$, with o_{MAX} having a non-informative prior on [1,10] to consider that a maximum count likely overestimates population size.

(g) Density dependence on pack size

Using data from all packs monitored in Wisconsin from 1995 to 2011 (data from 2012 were not available), we modelled the true size P_i of each pack i at time t as being Poisson distributed with mean χ_t^{P} being a linear function of population size N_t^{W} (W for Wisconsin) during year t:

$$P_i \sim \text{Poisson}(\chi_i^{\text{P}}),$$

$$\log(\chi_i^{\text{P}}) = \beta_0^{\text{P}} + \beta_1^{\text{P}} \cdot N_t^{\text{W}}.$$

Coefficients of the linear function were parametrized with non-informative priors (electronic supplementary material, table S2).

Observed size Pobs_i of each pack followed a gamma distribution with mean equal to the prediction of the process model of pack size and a standard deviation for observation error σ_{Pobs} having an informative prior assuming an error of ± 1

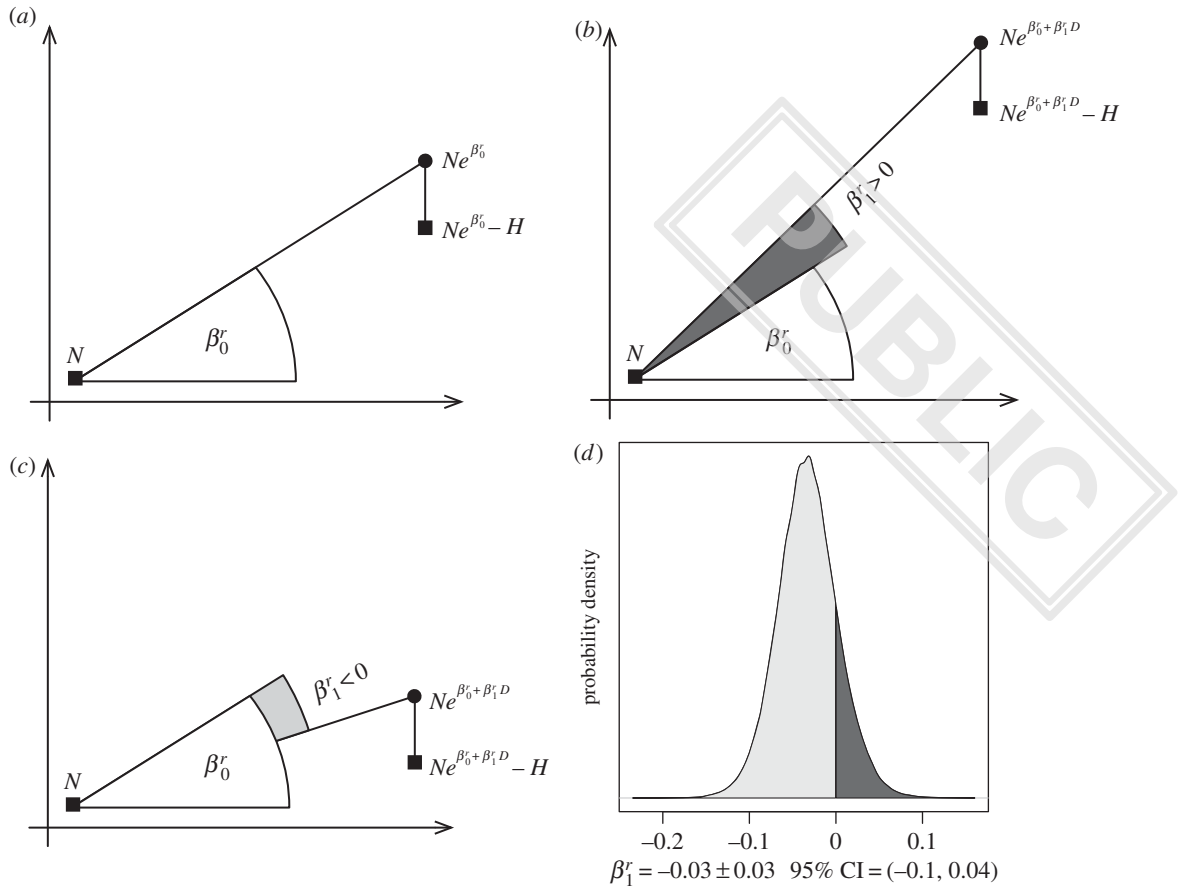

Figure 2. Conceptual model of how culling policy signal influences growth rate. From one time step to the next (horizontal axis), a population has a potential growth rate $r = \beta_0^r$ which does not account for the animals culled H (panel *a*). With a culling policy signal lasting duration D (proportion of a year), the potential growth rate becomes $r = \beta_0^r + \beta_1^r D$, and increases when $\beta_1^r > 0$ (through a decrease of poaching, panel *b*), or alternately decreases when $\beta_1^r < 0$ (through an increase of poaching, panel *c*) as we found here. The effect β_1^r of the culling policy signal on population growth rate r is independent of the number of wolves culled H during implementation. The posterior density distribution β_1^r (panel *d*) shows a decline of growth rate is five times more likely $P(\beta_1^r < 0) = 0.83$ (light grey area) than an increase $P(\beta_1^r > 0) = 0.17$.

wolf when monitoring pack size (electronic supplementary material, table S2):

$$\text{Pobs}_i \sim \Gamma\left(\alpha_P = \left(\frac{P_i}{\sigma_{\text{Pobs}}}\right)^2, \beta_P = \frac{P_i}{(\sigma_{\text{Pobs}})^2}\right).$$

(h) Density dependence on probability a pack reproduces

Using data from all packs monitored in Wisconsin from 1995 to 2011, we modelled the event of a pack reproducing as following a Bernoulli distribution with probability described by a logistic function of population size N_t^{W} (W for Wisconsin) during year t:

$$R_i \sim \text{Bern}(\varphi_i),$$
$$\text{logit}(\varphi_i) = \beta_0^R + \beta_1^R \cdot N_t^{\text{W}}.$$

Annual coefficients of the linear function were parametrized with non-informative priors (electronic supplementary material, table S2).

(i) Density dependence on area occupied by packs

Using wolf pack territory sizes [30] from 2000 to 2011 (mapping prior to 2000 was not based on GPS locations), we calculated the total area (in square kilometres) occupied by wolf packs in year t. In the hierarchical model, we then assumed this area was a linear function of population size Nobs_t^{W} (W for Wisconsin) at year t with a stochastic error τ^A:

$$A_t \sim \text{Norm}(\beta_0^A + \beta_1^A \cdot N_t^{\text{W}}, \tau^A).$$

Coefficients of the linear function were parametrized with non-informative priors (electronic supplementary material, table S2).

(j) Monte Carlo Markov chain inference

We ran eight Monte Carlo Markov chains (100 000 iterations thinning by 10 after adapting and updating for 50 000 iterations) in R [33] with JAGS [34]. We checked convergence with the Gelman & Rubin [35] and Heidelberger & Welch [36] diagnostic tests. Posterior parameter estimates revealed a lack of density dependence (electronic supplementary material, table S2), and if any density dependence had occurred, it was much more likely to be positive (electronic supplementary material, figure S1–S4).

3. Results

We found that the policy signal generated by liberalizing wolf culling was associated with an average decrease in wolf potential population growth rates. With no culling policy signal, the annual potential growth rate (excluding the culled wolves, figure 2) was $r = 0.16 \pm 0.02$, 95% CI = 0.12–0.2 in Wisconsin ($r = 0.14 \pm 0.02$, 95% CI = 0.1–0.18 in Michigan). However, with a year-long culling policy signal, we found annual growth rate had a 83% probability to be lower (figure 2*d*) with $r = 0.12 \pm 0.03$, 95% CI = 0.07–0.19 in Wisconsin ($r = 0.10 \pm 0.03$, 95% CI = 0.05–0.17 in Michigan). Crucially, this decrease in population growth was independent

of the number of wolves culled, as our population model made the explicit distinction between a policy (number of days when culling was allowed) and its implementation (number of wolves culled, figure 2). The model could therefore detect an effect of allowing culling even if no wolves were killed.

Similar results emerged when we replaced the culling policy signal with the announcement of federal delisting as the policy signal because culling happened primarily when wolves in the two states were federally delisted (figure 1). Even though we cannot disentangle the two causal mechanisms (allowing culling or delisting), our analyses suggest a policy signal to relax protections for wolves affected subsequent wolf population growth.

4. Discussion

We infer that variations in wolf population growth rates we detected were variations in poaching resulting from policy changes. Although our model does not include poaching as an explicit parameter, poaching was the most parsimonious explanation for observed decrease in wolf population growth rates, because we could rule out alternative plausible biological explanations. The most intuitive explanation of slowing growth with a growing population would be negative density dependence. We could not directly include density dependence in our population prediction model as it would be a weakly identifiable parameter with poaching. Instead, we used additional data in a Bayesian model that were biologically meaningful to detect density dependence (average pack size, probability a pack reproduces, and area occupied by wolf packs, see electronic supplementary material, table S2 and figures S1–S4). As with prior studies on Wisconsin's wolf population [28], we did not detect any negative density dependence. A second plausible alternative explanation for the observed decrease in population growth rates would be super-additive mortality, i.e. the decline in growth rates we detect might reflect other wolves dying because of the loss of wolves killed during culling periods. The debate whether human-induced mortality in wolves is compensatory, additive or super-additive is not settled yet [32,37,38]. We therefore used an informative prior by assuming the same additivity as found for wolf populations across North America [32] (see electronic supplementary material, table S2). If the decline in growth rates we detected had been caused by super-additive mortality, that mortality would need to be stronger than any reported before. We consider such strong super-additive mortality unlikely because culling was implemented by springtime and summertime live-trapping principally [31] and not by hunting chase or other methods that might disturb entire packs during sensitive reproductive periods. Third, wolf emigration to neighbouring states was unlikely to increase only by a policy announcement. Fourth, natural fluctuations in wolf population size and monitoring quality were accounted for by our process and observation errors [39]. The increase of poaching we infer is therefore unlikely to be a consequence of a failure to account for natural fluctuations, which would in addition likely be less important than seen in smaller populations [39]. Finally, because periods without culling were directly inversely correlated with periods with culling [40], one could argue instead that the court-ordered termination of culling permits had triggered 'frustration poaching'. However, such frustration measured as negative attitudes to wolves was present well before the first culling was permitted [41], as was the poaching that might be caused by frustration and penalties for wolf poaching did not change [15]. In addition, a quasi-experimental longitudinal study of attitudes to wolves before and after Wisconsin's October 2012 regulated, public hunt of wolves revealed a decline in tolerance among men with familiarity with hunting who lived in Wisconsin's wolf range, exactly opposite to the predicted decrease in 'frustration' with more liberalized wolf killing [42]. Studies of attitude change since 2001 have repeatedly shown that liberalizing wolf killing did not reduce inclination to poach among residents of Wisconsin's wolf range [43,44]. As none of the alternative explanations had statistical or biological support, we could infer that variations in growth rates we detected were variations in poaching resulting from policy changes.

Our approach is different from previous studies [10,28,40] because we do not aim to quantify total poaching rate and its variations. Because the two states' wolf populations were not closed, migration rates were unknown and the cryptic nature of poaching events for radio-marked animals precluded obtaining informative parameter estimates. Our model instead estimated how poaching responded to an annual policy signal, without estimating total poaching, and it treated separately the policy signal from its implementation, which were only weakly correlated. Our results are also consistent with empirical studies that link intentions to poach with culling policy. For example, studies in Wisconsin that measured intention to poach wolves found those intentions rose in parallel with liberalized culling [44] and those intentions did not decline after a period with liberalized culling [43]. Moreover, legalizing wolf-hunting led to a continued decline in tolerance for wolves by summer 2013 [42]. We hypothesize the legal opening of an additional source of mortality sent a signal that the net benefits of wolves had declined, consistent with psychological theory of hazard assessment. For example, a recent experimental study of messaging found that public acceptance of American black bears *Ursus americanus*, diminished when informational messages did not include benefits of bears [45]. When the government kills a protected species, the perceived value of each individual of that species may decline. Liberalizing wolf culling may have sent a negative message about the value of wolves or that poaching prohibitions would not be enforced.

The assumption that legal killing would decrease illegal killing has often been portrayed as an effective way to manage recovering large carnivore populations and, despite no prior scientific evaluation, has been promoted by some conservation authorities [46]. For example, the World Conservation Union—IUCN claims through its manifesto for large carnivore conservation in Europe that 'legalised hunting of large carnivores can be a useful tool in decreasing illegal killing' [47]. In light of our results, we find this recommendation has no support. Indeed, liberalizing killing appears to be a conservation strategy that may achieve the opposite outcome than that intended.

Because the wolf habitat in the two US states in our study does not include wilderness and consists mostly of a human-dominated matrix, our results are particularly meaningful to understand the mechanisms of coexistence between large carnivores and people worldwide [48,49]. We recommend that efforts at leniency in environmental protections are not justified as a way to prevent illegal activities unless solid rigorous evidence is provided. We conclude by stressing that many

environmental policies produce both signals and implementations, which can be treated as experimental interventions with separate and possibly contradictory effects. Whether anti-pollution or anti-poaching policies are being crafted, the perception of that policy may be as important to understand carefully, as are the enforcement and compliance checks that represent implementation.

Data accessibility. The datasets supporting this article are available at http://dx.doi.org/10.5061/dryad.b7d7v.

Authors' contributions. G.C. conducted Bayesian analyses. A.T. collated and interpreted data. G.C. and A.T. wrote the paper and contributed equally.

Competing interests. We declare we have no competing interests.

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Supplementary Information

Table S1. Periods for culling policy signals in both states, derived from *(15)*, ESA sec. 10(a)(1)(A) and Humane Society of the U.S. et al. v. Jewell (U.S. District Court, D.C., 1:13-cv-00186-BAH Document 52, 2014.

Period start (dd/mm/yyyy)	Period end (dd/mm/yyyy)	Federal status	Culling**
15/04/1994	31/03/2003	Listed as endangered	not allowed
01/04/2003	30/01/2005	Down-listed to threatened	allowed
31/01/2005	31/03/2005	Relisted	not allowed
01/04/2005	13/09/2005	Sub-permit for culling issued	allowed
14/09/2005	23/04/2006	Sub-permit rescinded	not allowed
24/04/2006*	31/07/2006	Sub-permit for culling issued	allowed
01/08/2006	11/03/2007	Sub-permit rescinded	not allowed
12/03/2007	28/09/2008	Delisted	allowed
29/09/2008	03/05/2009	Relisted	not allowed
04/05/2009	30/06/2009	Delisted	allowed
01/07/2009	26/01/2012	Relisted	not allowed
27/01/2012	14/04/2012	Delisted	allowed

*States identical except sub-permit issuance on 6 May 2006 to Michigan instead of issuance on 24 April 2006 to Wisconsin *(15)*.

** Killing a wolf that posed a threat to human safety was always allowed under ESA sec.11(a)(3)

11 **Table S2.** Prior and posterior values for all model parameters.

12

Prior choice	**Posterior distribution**	
	Median ± SD	95% credible interval
Population dynamic		
$\sigma_{proc} \sim \text{unif}(0,0.5)$	0.06 ± 0.02	0.03 – 0.1
$\gamma \sim \text{Norm}(\mu = 1.06, \tau = 14)$	1.06 ± 0.07	0.92 – 1.19
$\beta_0^{rW} \sim \text{Norm}(\mu = 0, \tau = 10^{-6})$	0.16 ± 0.02	0.12 – 0.2
$\beta_0^{rM} \sim \text{Norm}(\mu = 0, \tau = 10^{-6})$	0.14 ± 0.02	0.1 – 0.18
$\beta_1^{r} \sim \text{Norm}(\mu = 0, \tau = 10^{-6})$	-0.03 ± 0.03	-0.1 – 0.04
$\sigma_{Nobs}^{\min} \sim \text{unif}(0,100)$	3.82 ± 3.39	0.19 – 12.63
$\sigma_{Nobs}^{\max} \sim \text{unif}(0,100)$	4.72 ± 4.5	0.23 – 16.78
$o_{MIN} \sim \text{Norm}(\mu = 1, \tau = 10^{-6})$ $o_{MIN} \in]0,1]$	0.97 ± 0.02	0.93 – 1
$o_{MAX} \sim \text{Norm}(\mu = 1, \tau = 10^{-6})$ $o_{MAX} \in [1,10[$	1.03 ± 0.02	1 – 1.08
Density dependence on pack size		
$\beta_0^{P} \sim \text{Norm}(\mu = 0, \tau = 10^{-6})$	1.17 ± 0.03 *	1.1 – 1.23
$\beta_1^{P} \sim \text{Norm}(\mu = 0, \tau = 10^{-6})$	0 ± 0	0 – 0
$\sigma_{Pobs} \sim \text{unif}(0,1)$	0.17 ± 0	0.16 – 0.17
Density dependence on probability a pack reproduces		

$\beta_0^R \sim \text{Norm}\left(\mu = 0, \tau = 10^{-6}\right)$	0.39 ± 0.13	0.14 – 0.64
$\beta_1^R \sim \text{Norm}\left(\mu = 0, \tau = 10^{-6}\right)$	0 ± 0	0 – 0
Density dependence on area occupied by packs		
$\tau^A \sim \text{T}\left(\alpha = 10^{-6}, \beta = 10^{-6}\right)$	97 ± 46	33 – 212
$\beta_0^A \sim \text{Norm}\left(\mu = 0, \tau = 10^{-6}\right)$	9.61 ± 0.1	9.42 – 9.81
$\beta_1^A \sim \text{Norm}\left(\mu = 0, \tau = 10^{-6}\right)$	0 ± 0	0 – 0

13 * on the log scale

14

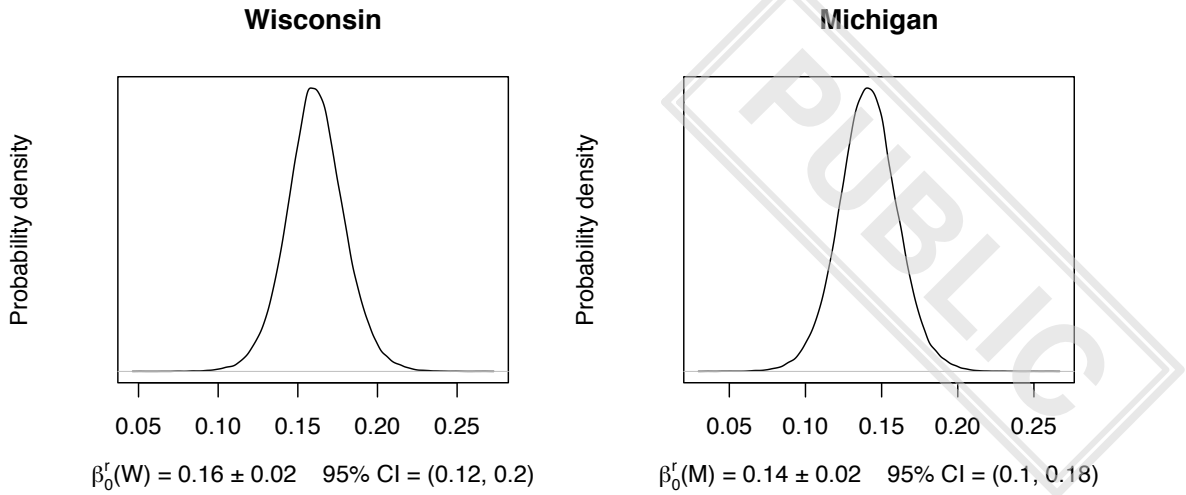


Figure S1. Posterior density distributions of intercepts β_0^{rW} (Wisconsin, left) and β_0^{rM} (Michigan, right) of population growth rates (without policy signal).

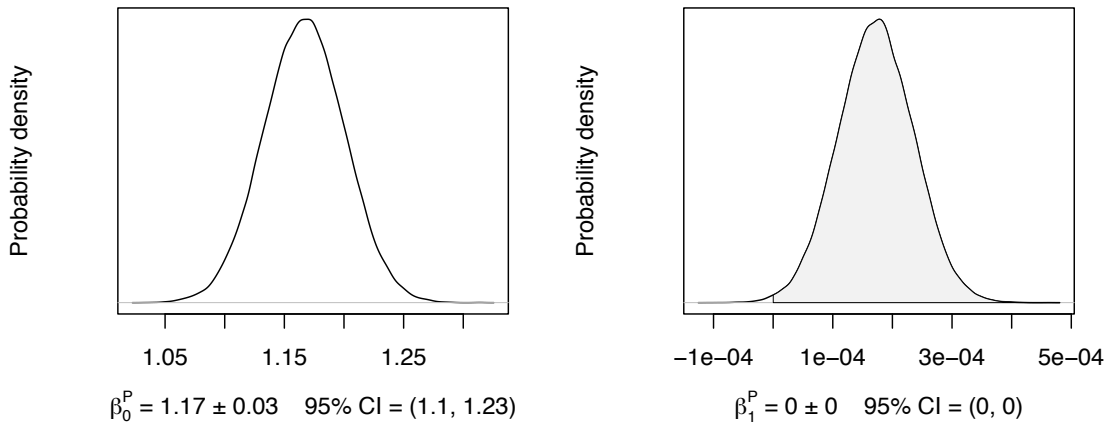
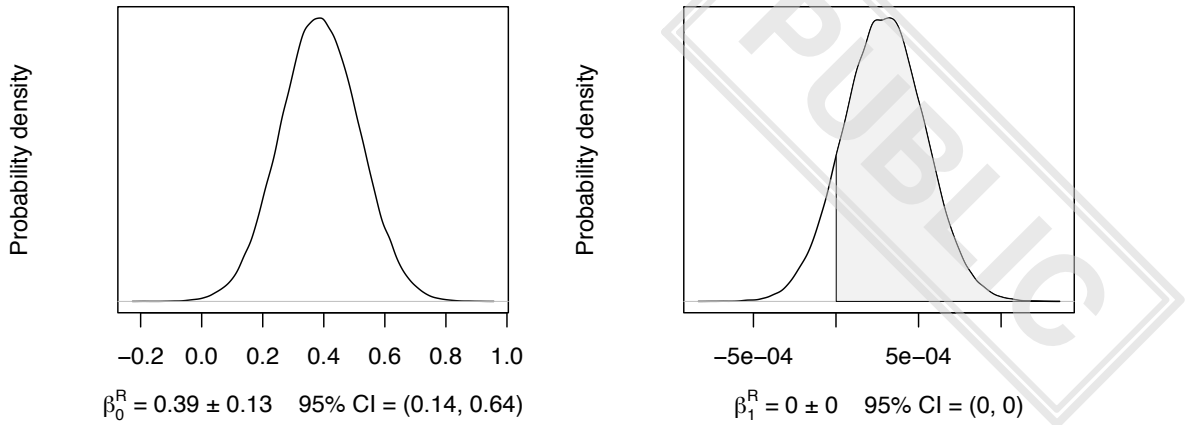


Figure S2. Posterior density distributions of linear model coefficients (intercept β_0^P) and (slope β_1^P) for pack size. The grey area under the curve at right indicates the probability there is no negative density dependence.



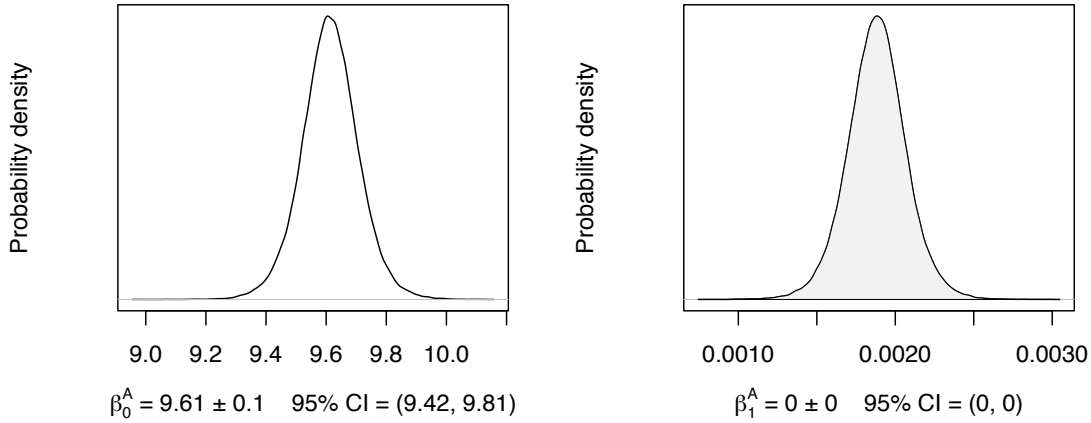
24

25 **Figure S3.** Posterior density distributions of linear model coefficients (intercept β_0^R)

26 and (slope β_1^R) for the probability a pack reproduces. The grey area under the curve at

27 right indicates the probability there is no negative density dependence.

28



29

30 **Figure S4.** Posterior density distributions of linear model coefficients (intercept β_0^A)

31 and (slope β_1^A) for area occupied by wolf packs. The grey area under the curve at right

32 indicates the probability there is no negative density dependence.

33

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Liberalizing the killing of endangered wolves was associated with more disappearances of collared individuals in Wisconsin, USA

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Although poaching (illegal killing) is an important cause of death for large carnivores globally, the effect of lethal management policies on poaching is unknown for many populations. Two opposing hypotheses have been proposed: liberalizing killing may decrease poaching incidence ('tolerance hunting') or increase it ('facilitated poaching'). For gray wolves in Wisconsin, USA, we evaluated how five causes of death and disappearances of monitored, adult wolves were influenced by policy changes. We found slight decreases in reported wolf poaching hazard and incidence during six liberalized killing periods, but that was outweighed by larger increases in hazard and incidence of disappearance. Although the observed increase in the hazard of disappearance cannot be definitively shown to have been caused by an increase in cryptic poaching, we discuss two additional independent lines of evidence making this the most likely explanation for changing incidence among n = 513 wolves' deaths or disappearances during 12 replicated changes in policy. Support for the facilitated poaching hypothesis suggests the increase (11–34%) in disappearances reflects that poachers killed more wolves and concealed more evidence when the government relaxed protections for endangered wolves. We propose a refinement of the hypothesis of 'facilitated poaching' that narrows the cognitive and behavioral mechanisms underlying wolf-killing.

Globally, loss of large predators has contributed to simplification of trophic structures, lower biodiversity and degradation of ecosystem functions[1–3]. It is widely acknowledged that humans are responsible for more large carnivore deaths than any other cause[4], although the scientific debate about the sustainability of this killing remains far from settled for many large carnivore populations[3,5,6]. Many policies for large carnivores focus on limiting or regulating human-caused mortality, and many management decisions rely on estimates of human-caused mortality and on understanding the policy effects on such mortality. Therefore, biased estimates of human-caused mortality patterns can undermine policy goals and evaluations (e.g., recolonization by endangered species, restoring ecosystem processes), and harm carnivore population recovery or stability[5–7]. More broadly, accurate estimates of policy effects on illegal killing ('poaching' hereafter) of wild animals can improve enforcement of laws for nature protection and adherence to national and international treaties relating to the protection or the restoration of endangered species, ecosystems, biodiversity, and interdiction of unregulated wildlife trade.

Of all direct killing by humans, poaching is the primary cause of death in many carnivore populations[5,8–11], slowing population growth[12–14] or hindering recolonization of historic range[8,10]. Poaching is extremely difficult to detect, measure and prevent. Given its illegal nature, poachers often conceal evidence from management authorities tasked with monitoring marked animals. When authorities find the body of a poached animal they might detect that the individual was poached, but many wild animals die undetected. Measurement uncertainty rises from low but non-zero in the latter case to very high when poachers conceal evidence or when marked animals elude monitoring by those authorities. 'Cryptic poaching'[10] refers to this type of unreported, concealed

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illegal killing. Several studies have estimated it as rivaling or exceeding the subset of reported poaching detected and measured by authorities[9,10,15]. Therefore, in places where poaching is often cryptic, official estimates of mortality process and pattern are systematically biased to under-estimate the risk of poaching, unless analysts adequately account for uncertainty. Such accounting has been facilitated by a variety of statistical techniques developed since 2011[10].

Traditional methods for estimating mortality hazard (i.e., the instantaneous probability of an event such as poaching occurring), incidence (i.e., probability of an event such as poaching occurring in the presence of other mortality sources), and for partitioning those rate parameters among various human and non-human causes typically require data from marked individuals (e.g., collared animals recaptured dead or alive). Yet these traditional methods assume that the marked individuals that are never recaptured or recovered (disappeared hereafter) had suffered from similar causes of death as those recaptured. That assumption proved highly inaccurate for wolves, because systematic measurement biases caused by disappearances and other forms of uncertainty disproportionately affect poaching rather than other causes of death. Failure to account for these biases has led to under-estimating poaching, misidentifying the major cause of death and failing to intervene effectively against wolf-poaching[9,16]. Liberg et al.[10], to our knowledge, was the first to correct for this underestimation and quantify cryptic poaching. Their analysis of Scandinavian wolf deaths estimated poaching at half of total mortality (51%), with two-thirds attributed to cryptic poaching. Similarly, a later estimate for Wisconsin wolves put the proportion of cryptic poaching at 50%[5]. Efforts to correct poaching estimates for four endangered wolf populations in the contiguous USA found traditional methods overestimated the relative risk of legal killing by 5–16% and underestimated it for poaching by 17–44%[9]. That study also concluded that poaching (observed and cryptic) was the major cause of death for all studied wolf populations.

Quantifying poaching hazard, incidence, and patterns (including its cryptic variant), and how these might be affected by policy, can improve the design of management interventions and thereby hasten restoration and conservation. However, the scientific literature has just begun evaluating the influence of policies on poaching hazard and incidence. A long-held assumption has been that some predator control (e.g.: special permits for killing or hunting seasons) might increase tolerance for controversial species and thus reduce poaching; a claim first argued in a legal brief by the U.S. government in 2006 (Humane Society of US v. Kempthorne, docket DC 06-1279) and articulated as a scientific hypothesis in[17], and later developed and renamed 'tolerance hunting'[18–20]. In Wisconsin, USA a series of studies have taken up the question using mortality data. One early study examined reported poaching variation[21] to hypothesize that frustration with inconsistent management may lead to increased poaching, and colleagues modeled wolf demographic parameters in relation to policy changes (for others, see[22]). However, these studies provide weak inference due to several shortcomings: reliance on correlative analyses, failure to consider cryptic poaching, plus unresolved concerns about modelling of density-dependence and its potential confounding effects of various changes in monitoring methods entangled with so-called 'recovery periods'[18,23].

A parallel and independent analysis of the Wisconsin and Michigan wolf populations found that periods with policy that liberalized wolf-killing were followed by significant decreases in potential population growth rates independent of the number of wolves killed legally[12,14]. The authors inferred increases in poaching during six periods of policy that liberalized wolf-killing had caused several decreases in growth rates and that the resumption of more protective policies caused several increases in growth rates. These authors suggested what we now call the 'facilitated poaching' hypothesis, which proposes that would-be poachers respond to the policy changes as a signal to increase their activities, possibly associated with cognitive processes relating to values (e.g., lower value of wolves in the eyes of would-be poachers), social norms (e.g., greater acceptability of poaching, or less enforcement against poaching), or perceived control (e.g., would-be poachers perceive themselves helping authorities to kill wolves). This hypothesis is supported by four quantitative surveys of residents of Wisconsin from 2001 to 2013 and two qualitative focus groups from 2011 to 2012, which revealed increased inclinations to poach after Wisconsin wolf policies liberalized killing[24,25]. Three critiques of the 'facilitated poaching' hypothesis were published, and one critique of the 'frustration' hypothesis, so the scientific debate is lively but it remains based on indirect evidence and weak to moderate strengths of inference[26].

Subsequent research linking wolf mortality to population growth rates in Finland found poaching rates increased as a response to increases in wolf population size[8]. Follow-up research by the same team found the total number of legally hunted wolves at the local scale and the country scale decreased the probability of poaching, while increases in the number of permits issued to kill wolves (the 'bag limit') increased the probability of poaching[27]. The authors hypothesized that the declines in probability of poaching, given more wolves killed through legal hunting, might reflect a decrease in the number of individual wolves exposed to poaching because they were instead legally killed prior to potential poaching, essentially "just cleaning up the numbers"[27]. However, their analyses did not statistically account for the uncertainties in causes of death and disappearance.

No study explicitly modeled the durations and periods of policy that individual wolves were exposed to legal killing[12,28]. That would allow for the estimation of mortality hazard and incidence (from various causes) for individual wolves that *experienced* the policy over time. With individual-level estimates of hazard and incidence for marked individual wolves, we can more confidently draw inference about population-level effects on the growth rate and patterns of poaching. Nor did these studies model the effect of legal killing on wolf disappearances (those animals 'lost-to-follow-up'; LTF). LTF animals could not have been killed by legal means or by conspicuous causes, otherwise their carcasses would have been recovered[5,9]. Thus, LTF could conceal a component of cryptic poaching, in addition to those collared individuals that moved out of radio-telemetry range or those who died from natural causes but whose radio-transmitters suffered mechanical failure beforehand.

Here we test the hypothesis that poaching (both observed and cryptic) of adult wolves in Wisconsin, USA was influenced by changes in government policies via effects on individual wolf deaths and disappearances (from 1979 to 2012, 513 collared adults), which we modeled by mortality hazard and incidence in a competing risks

framework. Widely used in the biomedical literature for the estimation of risk and prognosis for health interventions, competing risk analyses allowed us to estimate both hazards and incidences of various causes of death or disappearance in relation to wolves' exposure time to policy. Therefore, competing risk analyses illuminate one fate ('endpoint' hereafter) among many, to understand the effects of policy for individual wolves, for all endpoints, especially LTF and its cryptic poaching component. Following recommendations for the most rigorous approach to competing risk analysis[29–32], we report results on all endpoint-specific hazards and CIFs and synthesize findings from both. In interpreting and discussing the results of our analyses, specifically point estimates and compatibility intervals, we follow the recommendations of researchers who argued for expanding discussion beyond traditional, arbitrary thresholds of 'statistical significance'[33]. Instead, we provide point estimates and compatibility intervals (i.e., 'confidence intervals') for our MAIN imputation scenario. We present and discuss the distributions of parameters of interest as well as simulation scenarios for 26 wolves with incomplete data (see "Materials and methods" section). In our discussion, we focus on the resulting point estimates as the most compatible values given our data and assumptions. We then discuss the implications of our model assumptions and uncertainty in our data, in particular for those results relevant to policy effects on mortality hazards and incidences.

Our results suggest that reduced protections under the Endangered Species Act (ESA) for wolves in the form of policies allowing selective liberalized killing may increase wolf mortality risk and incidence beyond the wolves legally killed. Given the ubiquity of large carnivore poaching, our research and methods can improve the effectiveness of many jurisdictions' policies on environmental crimes, endangered species, and protections for wild animals.

Results

The six periods (Supplementary Table S2) during which policy that liberalized wolf-killing were associated with various significant changes in endpoints for collared adult wolves**,** whether one examined hazards from Cox models, subhazards from Fine-Gray (FG) competing risk models, or their cumulative incidence functions (CIFs).

Policy and covariate effects on endpoint hazards. The 6 policy periods with liberalized killing (Supplementary Table S2) were 10–33% more hazardous for wolves to be lost-to-follow up (LTF) than policy periods with full protection. Liberalized killing periods were also more hazardous for legal killing, not surprisingly. Liberalized killing periods were less hazardous for monitored wolves reported poached than periods of full protection. We compare those three effects directly below, in light of existing theory.

Liberalized killing periods were more hazardous for two causes of death, the nonhuman and uncertain endpoints, and less hazardous for collisions, than periods of full protection. Winters were at least twice as hazardous as summers for the three most common endpoints (LTF, poached and nonhuman).

Lost to follow-up (LTF). Liberalized killing periods were 18% (HR 1.18) more hazardous than periods of full protection, yet compatible with a relatively narrow 13% decrease to a 60% increase in hazard (HR 95% CI 0.87–1.60). The resulting LTF HR distribution suggests an 85% probability of an increase in LTF hazard from the liberalized killing policy period (Fig. 1, Table 1). These estimates depend on imputing the LTF (or 'censored') endpoint for 26 collared wolves whose records were incomplete in 2012 (Supplementary Tables S3, S4). We report the conservative MAIN imputation scenario in Fig. 1 (see Supplementary Tables S5, S6 for model diagnostics), which is consistent with the distribution of LTF in the overall sample, but also offer two alternative scenarios (LOW and HIGH) that generate HR estimates resulting in narrower bounds, spanning 10–33% increases in hazard for LTF endpoints (Supplementary Table S7).

For LTF endpoints, winters were 213% more hazardous than summers, with a broad range 99–393% (Fig. 1, Table 1). The estimated LTF HR of 3.13 at baseline with a time-varying coefficient of 0.69/year means that winter was very hazardous after initial collaring, but then decreased substantially ($3.13 \times 0.69 = 2.16$ and $3.13 \times 0.69 \times 0.69 = 1.49$), to a 116% and 49% increase in hazard (relative to summer) at 1 and 2 years after collaring, respectively.

Reported poached. Liberalized killing periods were 19% less hazardous for the endpoint of reported poaching (Table 1), yet a 52% decrease to a 35% increase in hazard were also compatible with the data (Table 1, Fig. 2). The resulting poached HR distribution suggests a 79% probability of a decrease in the hazard from the liberalized killing policy signal (Fig. 2). Winters were 370% more hazardous for the endpoint reported poached, with broad compatible estimates spanning increases between 147 and 791% (Table 1, Fig. 2).

We found an effect of census period on reported poaching; a 65% decrease in hazard during census period 2 1995–2000 (relative to census period 1, 1979–1994), with narrow compatible estimates spanning 84–24% decrease in hazard (Table 1, Fig. 1).

Legal killing. As the policy intended, liberalized killing periods were 57% more hazardous for the endpoint *legal* than periods of full protection, with compatible estimates spanning a broad range of 40% decrease to a 307% increase. The estimated *legal* HR of 1.57 at baseline with a time-varying coefficient of 2.07/year means that liberalized killing policies were associated with substantial increase over monitoring time ($1.57 \times 2.07 = 3.25$ and $1.57 \times 2.07 \times 2.07 = 6.73$), to a 225% and 573% increase in hazard (relative to full protection periods) at 1 and 2 years after collaring, respectively. The broad range of compatibility estimates indicates variability in the time it took for marked wolves to die from this cause, in policy periods ranging from x to y days of liberalized killing.

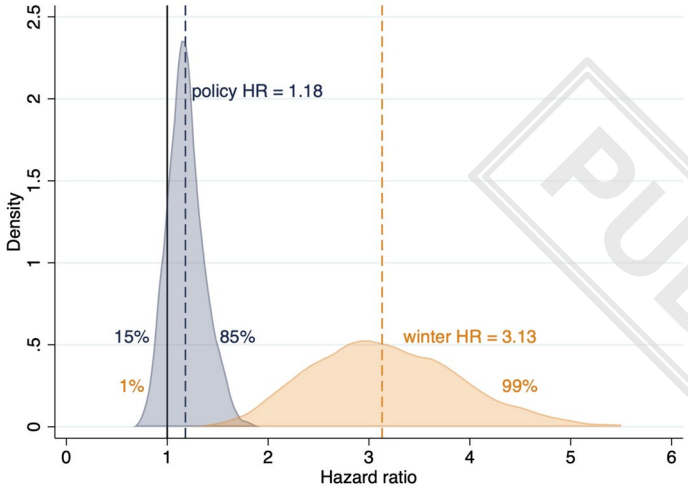

Figure 1. Hazard ratio (HR) of wolves lost to follow-up (LTF, n = 243 in MAIN* scenario) during liberalized killing policy periods (blue) relative to periods of full protection and during winter (orange) relative to summer. Bell curves illustrate the HR distributions with the same color of dashed lines and text as the bell curves to which they correspond for HR point estimates (n = 513). The vertical black solid line at HR = 1 (no effect) is provided for comparison to dashed lines indicating HR point estimates for covariates. Probabilities (%) of a HR of < 1 (left side) or > 1 (right side) are shown with color-coded text for each HR distribution. *We built LTF (or censored) endpoint imputation models (IMs) in three scenarios for 26 collared wolves with missing endpoints (5.1% of collared wolves, see "Materials and methods" section and Supplemental Text). Our MAIN imputation scenario resulted in 12 of the 26 wolves going LTF (average $T = 947$ days), which is consistent with the expected proportion from the aggregate data in which 46% had an LTF endpoint. Results for the LOW and HIGH scenarios are presented in Supplementary Table S7 and narrowed the bounds of the LTF CI.

	Endpoint											
	Lost to follow-up (LTF)		Reported poached		Legal		Nonhuman		Collision		Uncertain	
Variable	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Liberalized killing periods (lib_kill)	1.18	0.87–1.60	0.81	0.48–1.35	1.57	0.60–4.07	1.09	0.64–1.87	0.43	0.14–1.36	1.36	0.55–3.34
Winter periods (winter)	3.13	1.99–4.93	4.7	2.47–8.91	1	–	2.03	1.08–3.81	0.48	0.20–1.13	1	–
Census periods (method_change)												
Census method 1	1	–	1	–	1	–	1	–	1	–	1	–
Census method 2	1	–	0.35	0.16–0.76	1	–	1	–	1	–	1	–
Census method 3			1	–	1	–	1	–	1	–	1	–
Time-varying coefficient (tvc)												
Liberalized killing periods (lib_kill tvc) (change per year)	1	–	1	–	2.07	1–4.29	1	–	1	–	1	–
Winter periods (winter tvc) (change per year)	0.69	0.48–0.69	1	–	1	–	1	–	1	–	1	–

Table 1. Hazard ratio (HR) point estimates from the stratified joint Cox Model 5 (M5) for n = 513 monitored wolves (for MAIN* LTF imputation scenario), by endpoint. We present HRs and compatibility intervals (95% CI) for all covariate-endpoint interactions. Model selection criteria revealed that M5 was the best model (Supplementary Figs. S1, S2, Tables S5, S6 for model diagnostics).

Nonhuman, collisions and uncertain. Liberalized killing periods were 9% more hazardous for the endpoint of dying by nonhuman cause (57% decrease for collisions; 36% increase for uncertain), with a narrow range of 36% decrease to an 87% increase also compatible with our data (a broad range of − 86% to + 36% for collisions; and a broad range of − 45% to + 234% for uncertain). Winters were associated with an increase in the nonhuman endpoint HR of 103%, with compatible estimates spanning increases of 8–281% (Table 1).

Next, we evaluated how the same covariates as above affected the incidence of each endpoint, using FG models to consider the effect of competing risks on a single endpoint. In FG models of incidence, common endpoints gain importance and rarer endpoints lose importance proportional to their prevalence in the population. By comparison with hazard ratios that do not consider monitored wolves experiencing other endpoints, subhazard ratios consider all endpoints in the dataset up to the time point in question.

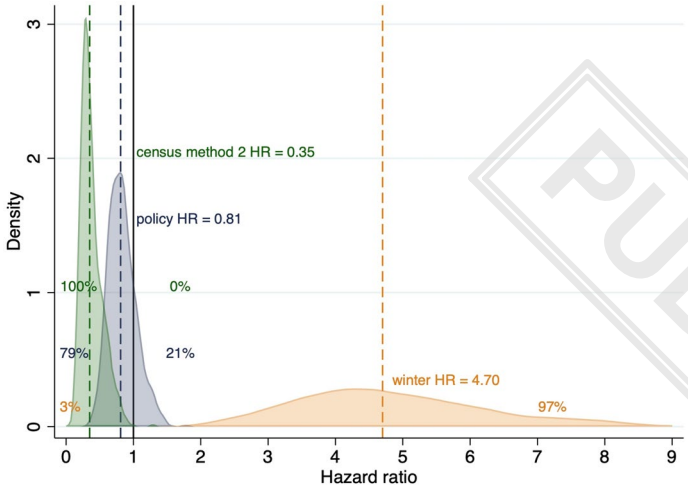

Figure 2. Hazard ratio (HR) of wolves reported poached (n = 88) during liberalized killing policy periods (blue) relative to periods of full protection; winter (orange) relative to summer; census period 2 (1995–2000) relative to census period 1 (1979–1994). Bell curves, vertical lines, text and color coding as in Fig. 1.

	Endpoint											
	Lost to follow-up (LTF)		Reported Poached		Legal		Nonhuman		Collision		Uncertain	
Variable	SHR	95% CI	SHR	95% CI	SHR	95% CI	SHR	95% CI	SHR	95% CI	SHR	95% CI
Liberalized killing periods (lib_kill)	1.19	0.86–1.65	0.76	0.44–1.31	1.57	0.59–4.12	1.17	0.67–2.03	0.42	0.13–1.37	1.32	0.55–3.16
Winter periods (winter)	2.89	1.89–4.42	3.36	1.88–6.00	1	–	2.04	1.17–3.54	0.53	0.25–1.14	0.39	0.16–0.96
Census periods (method_change)												
Census method 1	1	–	1	–	1	–	1	–	1	–	1	–
Census method 2	1	–	0.37	0.17–0.81	1	–	1	–	1	–	1	–
Census method 3	1	–	1	–	1	–	1	–	1	–	1	–
Time-varying coefficient (tvc)												
Liberalized killing periods (lib_kill tvc) (change per year)	1	–	1	–	2.07	1–6.17	1	–	1	–	1	–
Winter periods (winter tvc) (change per year)	0.69	0.48–0.69	1	–	1	–	1	–	1	–	1	–

Table 2. Subhazard ratio (SHR) point estimates from FG models for 513 monitored wolves for MAIN imputation scenario, by endpoint. We present SHRs and compatibility intervals (95% CI) for all covariate-endpoint interactions.

Policy and covariate effects on endpoint incidences in a competing risk framework. FG models revealed liberalized killing periods were associated with an increase in incidence of LTF of 11–34% relative to periods with full protections (Table 2, Supplementary Table S7). As intended by the policy, the former periods were associated with an increase in the incidence of legal killing. By contrast, liberalized killing periods were associated with a 24% decrease in incidence of reported poaching. FG models also suggest an increase in incidence of nonhuman and uncertain endpoints, along with a decrease in the incidence of death by collision.

LTF. Along with a suggested increase in LTF hazard (Table 1), disappearances of wolves were 19% more likely during policy periods with liberalized killing, relative to periods of full protections (i.e., the proportion of wolves over time going LTF increases), with compatible estimates from the MAIN imputation scenario spanning a 14% decrease to a 65% increase in incidence (Table 2). That range of compatible SHR values was narrowed by our imputation scenarios for the 26 wolves with missing data to a narrower 11%-34% increase in LTF incidence (Supplementary Table S7).

LTF incidence also increased by 189% during winter (relative to summer), with a nroad compatibility interval suggesting increases of 89–342%. The model also detects a non-proportional change (winter tvc) amounting to a 31% decrease in LTF incidence during winter periods for every year of monitoring a given marked wolf (Table 2).

Reported poached. Liberalized killing periods were associated with a decrease of 24% in the incidence of reported poaching, with broad compatible estimates spanning a 56% decrease to a 31% increase in incidence (Table 2). Winters were associated with an increase in incidence of 236%, with compatible estimates spanning

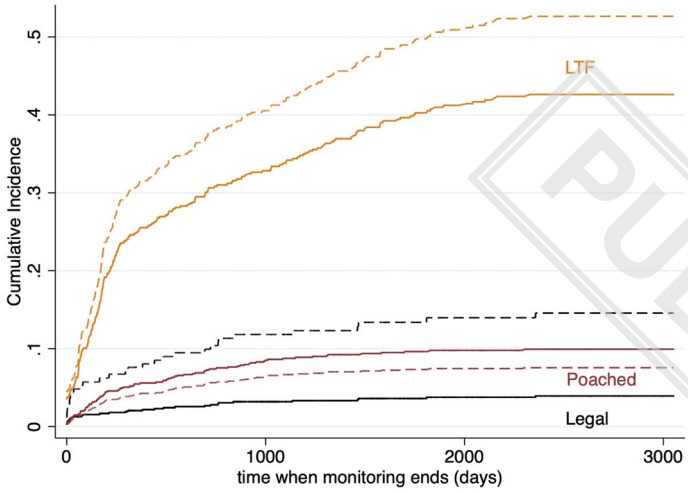

Figure 3. Cumulative incidence functions (CIFs) for 513 monitored wolves. Lines show separate endpoints for lost-to-follow-up, LTF (n = 243, orange), reported poached (n = 88, maroon), and legal kills (n = 32, black) in two periods, derived from Fine-Gray models for MAIN imputation scenario. For each endpoint, we illustrate the cumulative incidence for liberalized killing periods (dashed lines) and periods of full protection (solid lines). We derived CIF curves according to the M5 stratified joint Cox model (Supplementary Figs. S3–S8) and from each endpoint-specific semi-parametric FG models (Supplementary Tables S8, S9 for LTF and legal SHRs used for estimating FG CIFs, and Supplementary Figs. S9–S14) and non-parametric FG models (Supplementary Figs. S15–S20). Visual comparison of the three sets of CIF curves for each policy period-endpoint combination suggests consistent results between Cox and FG CIFs for most endpoints as well as compliance with FG model assumptions (i.e., proportionality of endpoint subhazards) for all endpoints except nonhuman (Supplementary Fig. S5).

a broad range of 88–500% (Table 2). During census period 2 (1995–2000), the incidence of reported poaching decreased by 63%, with compatible estimates spanning a narrow range of decreases of 83–29% (Table 2).

Legal killing. Consistent with the increase in hazard and the objective of the policy change, liberalized killing periods were associated with a 57% increase in the incidence of legal killing, with compatible estimates spanning a broad range of 41% decrease to a 312% increase. Along with this main policy effect, we obtain a similar (to the HR) non-proportional change amounting to a 107% increase in incidence during those policy periods for every year of monitoring a given wolf (Table 2).

Nonhuman, collision and uncertain. Liberalized killing periods were associated with a 17% increase in the incidence of death by nonhuman cause (58% decrease for collisions; 32% increase for uncertain), with broad compatible estimates spanning a 33% decrease to an 103% increase (−87% to +37% for collisions; −45% to +216% for uncertain). Winters seemed to increase the incidence of a nonhuman endpoint by 104%, with compatible estimates spanning increases of 17–254% (Table 2). The FG model for uncertain suggests an additional (to that of the Cox model) effect of census period associated with a 61% decrease in incidence of this endpoint, with compatible estimates spanning a narrow range of 84–4% decrease in incidence (Table 2).

We focus on the FG-derived CIFs (Fig. 3) because these consider the prevalence of endpoints in the population at which scale the hypotheses make predictions. The most relevant endpoints (LTF and poached) CIFs suggest liberalized killing periods were associated with an increase in the cumulative incidence of LTF of approximately 0.10 relative to full protection periods (Fig. 3; range 0.05–0.15 for LOW–HIGH imputation scenarios [Supplementary Tables S8, S9 Supplementary Figs. S21, S22]). This increase in LTF incidence is comparable to that of legal killing because of the high prevalence of LTF (i.e., the total number of LTF endpoints in the wolf population). Moreover, the increase in incidence of LTF associated with liberalized killing periods was 5 times larger than the associated decrease in the cumulative incidence of wolves reported poached during the same periods (0.02–0.03 decrease; Fig. 3).

Discussion

Traditional time-to-event models in wildlife science discard or censor data from marked animals that disappeared (no collar or carcass recovered) as uninformative. This approach fails to account for the high certainty attached to rates of legal causes of death compared to the low certainty about rates of other causes that are not well reported, including the least documented form termed cryptic poaching. Instead, the assumption that individuals that are lost-to-monitoring suffer from similar hazards and endpoints as monitored individuals, or survive through migration or dispersal, produce systematic biases. These biases may underestimate mortality and its anthropogenic component, but more perniciously, these biases may obscure or mislead during the evaluation

of any policy effects on mortality hazard and incidence. Our competing risk analyses illuminate how to evaluate policy effects on mortality without introducing the aforementioned assumptions leading to overwhelming biases.

The distribution of the LTF hazard ratio HR suggests a liberalized killing policy signal was associated with an 85% likelihood of increasing the risk of disappearance (Fig. 1) for monitored adults in Wisconsin. The situation is partially reversed for reported poaching, with the liberalized killing policy signal being associated with a 79% probability of a smaller decrease in hazard of being reported poached (Fig. 2). Neither of these changes reached statistical significance (Table 1), yet apparent similarities in these HR distributions are misleading because the incidence of disappearances (LTF) is so much greater than the incidence of observed poaching. We discuss the limitations of our study but when considering all the evidence, we infer that the policy of liberalizing wolf killing in Wisconsin from 2003 onward resulted in more cryptic poaching.

We found that periods with policies that liberalized wolf-killing were most compatible with increases in the hazard (10–33%) and more importantly, in the incidence (11–34%) of disappearances (LTF) among monitored wolves. The same periods were associated with decreases in the hazard (19%) and incidence (24%) of reported poaching of monitored wolves, along with an association with census method never before reported (discussed further below). Given the low number of observations as well as illustrated CIFs (Supplementary Figs. S17–S19), we are unable to discern any policy effects for the collision, uncertain, and nonhuman endpoints.

The suggested decline in reported poaching does not compensate for the LTF increase because LTF had a much higher prevalence in the dataset (n = 243; 47% compared to n = 88; 17.2% for reported poached). The importance of the relative prevalence of LTF and reported poaching is shown in cumulative incidence curves in Fig. 3. Indeed, the increase in cumulative incidence of LTF associated with liberalized killing policies seems comparable only to that of legal killing. Indeed, legal killing crossed HR = 1 (95% CI 0.60–4.07; Table 1), indicating that variance and uncertainty in something we know increased in those periods does not weaken the inference that hazard increased for legal killing. Rather, the compatibility interval indicates the variability in time it took for a monitored wolf to be killed and how many survived such periods. Moreover, we would argue the shape of the HR distributions (Figs. 1, 2) are important; both are sharply peaked and with considerably less uncertainty than our seasonal covariate.

The LTF endpoint is certainly an aggregation of three components: (1) individuals that had moved out of range of aerial radio-telemetry (i.e., long-distance migration), (2) collars that stopped transmitting (i.e., mechanical failures), and (3) unreported poached individuals ('cryptic poaching')[5]. Thus, the increase in LTF incidence associated with liberalized killing policies could result from increases in any of these components. We discuss at length each component below but we foreshadow our inference that the major component is cryptic poaching simply because there is no known mechanism through which a policy would cause wolves to migrate out of state or cause mechanical failure of collars. Based on our point estimates and resulting CIFs, our findings are consistent with the hypothesis that 'culling increases poaching'[12], compatible with growing evidence of cryptic poaching of predators around the world, and inconsistent with the U.S. federal government's claim in federal court that liberalizing wolf-killing would reduce poaching and protect the endangered wolves we studied here.

A plausible hypothesis for how liberalized killing periods may increase the incidence of emigration of monitored wolves would be through legal killing possibly causing disruption of wolf behavioral and social dynamics[34–36], leading to breeding pair dissolution or pack disbanding and perhaps increasing the number of dispersers leaving the state before the next monitoring period. However, the scientific evidence on the effects of anthropogenic mortality on wolf dispersal to date suggests the opposite effect; that low-to-moderate levels of anthropogenic mortality may instead be compensated by increased immigration from adjacent populations, and increased pup survival[15,37]. In their analysis of the effects of anthropogenic mortality on the wolf population in northern Alaska, Adams et al.[15] conclude that immigration was the main mechanism allowing otherwise unsustainable killing to continue for several years. Consistent with this, 7 times more radio-collared wolves entered Wisconsin from neighboring Michigan than went in the reverse direction, especially during the years with liberalized wolf-killing policies[5]. If liberalizing wolf-killing prompted more emigration by Wisconsin wolves, one might expect more vehicle collisions also. We found the opposite (Table 2). Therefore, emigration out of state seems an unlikely mechanism for the increase in LTF incidence.

Regarding collar failure, we are unable to suggest a possible mechanism associating the incidence of collar failure with liberalized killing periods for several reasons. First, given the technological advances related to collaring and monitoring between 1979 and 2003 (when liberalized killing periods begin; Supplementary Table S2) it seems unlikely that the incidence (or risk) of collar failure would be higher during these later time periods relative to periods of full protections. Moreover, if increased collar failure was a possible mechanism we would expect the incidence (or risk) of collar failures to increase as a function of monitoring time instead of the observed proportional increase in incidence during liberalized killing periods relative to full protection periods. To this we add that policy periods were implemented multiple times during those later time periods (Supplementary Table S2), which makes a confounding effect of collar failure implausible. Regarding the potential for lower temperatures to reduce battery life and affect LTF in winter, looking at both seasonal effects would seem to suggest cold temperatures having two contradictory effects on battery/mechanical failure: (1) a decrease in battery life relative to summer (main winter HR/SHR), but (2) also a decrease in this difference over time (illustrated through the season time-varying effect). Further, the magnitude of the seasonal effect on LTF, an increased risk of 213% in winter relative to summer, seems large enough to implicate a mechanism other than battery life.

The 'facilitated poaching' hypothesis proposes a human cognitive mechanism through which liberalized killing policies affect human behavior. The policy signal might decrease the value of wolves for potential poachers or increase the acceptability of poaching by their associates. Social survey research reported rising inclinations to poach wolves in Wisconsin three times after the implementation of liberalized killing policies[24,25,38], consistent with the 'facilitated poaching' hypothesis. In the three studies cited, certainty about the policy effect compared

to confounding effects increased as the intervals between resampling respondents decreased with each successive study.

The increases in incidence of monitored wolf disappearance (LTF) during liberalized killing periods suggest how the LTF component of cryptic poaching may obscure (at least part of) the additional mortality necessary to explain the slow-down in the population's annual growth rate from 2003 to 2011[22], and is consistent with increases in mortality over and above legal killing during said policy periods that were inferred to be responsible for population growth slow-downs[12,14]. Thus, the 'facilitated poaching' hypothesis seems the most plausible explanation for the rise in incidence of disappearances among Wisconsin's monitored wolves from 2003 to 2012. If this is indeed the case, LTF hazard rose because wolves faced an increased rate of cryptic poaching and incidence rose because the proportion of cryptically poached wolves increased.

The decrease we found in the incidence of reported poaching during liberalized killing policy periods might be interpreted as consistent with the 'tolerance hunting' hypothesis, which suggests that some lethal predator control may increase tolerance for the species and thus reduce poaching[17,18]. However, we cannot distinguish changes in reporting from changes in poaching with these data. In any case, looking only at the policy effect on reported poaching dismisses cryptic poaching, especially in light of evidence that most poaching goes unreported and thus underestimated in the Wisconsin wolf population and others[5,9,10]. Given the slight decreases in cumulative incidence of reported poaching that we found (approximately 0.02–0.03) and the more robust increases in LTF incidence (range 0.05–0.15 across our scenarios), it would suffice for just a portion of the suggested increase in LTF incidence to be attributable to cryptic poaching to (over)compensate for any decreases in reported poaching. For example, limiting the observed LTF incidence increase to the proportion of LTF wolves later found by means other than telemetry and found to have been poached (33%; a conservative minimum estimate) would still amount to a 0.02–0.05 incidence increase in cryptic poaching. Thus, our results undermine any claims of reductions in *total* (i.e., observed and cryptic) poaching from liberalized killing policies. (i.e., 'tolerance hunting'), contra Olson et al.[21,39].

Additionally, our results for reported poaching also seem consistent with another hypothesized relationship between legal killing and reported poaching from research in Finland. The notion of "cleaning up the numbers"[27], predicted a decline in reported poaching after increases in liberalized killing simply because fewer wolves are ;eft alive to be exposed to poaching. There seems to be no need to attribute this decline to human cognitive mechanisms (i.e., tolerance); wolves are simply killed legally at a higher rate (higher hazard and incidence) than they are reported poached during these periods (Tables 1, 2, Fig. 3). Indeed, we found that monitoring time (wolf collar transmitting) was associated with an increase in both the hazard and incidence of wolves being killed by government agents during liberalized killing periods. This result should not be ignored by decision-makers because it implies an (unplanned) accelerating incidence of legal killing during prolonged periods of liberalized killing. That is, once government agents are allowed to kill wolves, the likelihood of complaints or wolf deaths increased over time. Our present results seem to implicate human behavior in such a pattern, but further research is needed.

The 'facilitated poaching' explanation implies several non-mutually exclusive hypothetical mechanisms by which would-be poachers might respond to a policy signal to increase cryptic poaching. For instance, (a) would-be poachers feel emboldened by a perceived relaxation of anti-poaching laws during liberalized killing periods. This mechanism seems unlikely given cryptic poaching rose 2.5–7.5 times more than reported poaching decreased (Fig. 3). Alternatively (b), would-be poachers perceive a shift to social norms favoring their activities. This too seems unlikely given cryptic poaching remains covert while tolerance for poaching would seem to favor more overt poaching. Finally, (c) would-be poachers interpret wolves as having lower value because the government killing wolves suggests the population is too large. The latter hypothetical mechanism seems viable still and can be measured by classic valuation surveys, even perhaps conducted on the broad public rather than having to find would-be poachers to survey.

Our results also inform the literature on the effect of relaxing protections on environmental crimes. If we are correct in arguing the 'facilitated poaching' hypothesis is behind the suggested increases in cryptic poaching, then it seems that legalizing the killing of large nonhuman animals may drive their killing underground and perhaps motivate it, a hypothesis that has found support in research on the elephant ivory trade[40]. The increase in incidence of cryptic poaching we infer without an increase in reported poaching favors the idea that poachers remained averse to the risk posed by the state's authority to curb poaching (such as with increased enforcement or reestablishment of full federal protections). Here the observed decline in reported poaching incidence in census years 1995–2000 bears mention. Those years were associated with a change in methods to triple or more the number of wolf census-takers each winter[41]. Increasing human presence could have reduced either poaching activity or reporting (although there was no quantification of telemetry effort). The decline in unknown causes of death during the latter census period tends to support a view that additional volunteer census-takers each winter found more wolf carcasses—without any associated change in LTF during that same period. The role of census method requires further study therefore.

Given the scientific evidence suggesting continued declines in tolerance for wolves after the legalization of wolf-hunting in 2012[38], we hypothesize that cryptic poaching hazard and incidence may have increased after our study period. However, our study, results and scientific inferences are subject to various limitations. Our results are conditioned by any bias inherent in the WDNR data used, such as missing data for 26 wolves that we had to simulate and, in particular, measurement error for date of endpoint. The LTF endpoint is particularly susceptible to measurement error because wolves go LTF between monitoring intervals of weeks or months of unsuccessful monitoring, in most cases without reliable evidence with which to provide estimates of an actual LTF date. Time to event of LTF is the critical parameter in our analyses, not the number of wolves that went LTF, but regardless, the high proportion (119/231 = 52%) of wolves experiencing LTF during the first period of full protection (1979–31 March 2003, Supplementary Table S2) dismisses the concern that the absolute number of collared wolves in later periods potentially confounded our results. Our study is also limited by the lack of

individual-level variables (e.g., sex, breeding or dispersal status) that may affect wolf mortality. Moreover, the lack of randomization in the observational study is a weakness. Although we have adjusted for all reasonable and available predictors, the observed effects could still be at least partially attributed to residual confounding variables. However, these results are still interesting and useful for hypothesis generation in the absence of a randomized trial on liberalized wolf killing policy. Until randomized experiments are conducted, ours and other investigators' inferences are limited by being based on correlative associations, although our analyses enjoyed the benefits to inference that come from longitudinal analyses of long time series covering multiple policy changes.

Materials and methods

Data sources. Our dataset includes all collared wolves monitored by telemetry (virtually all VHF radio-transmitters) in Wisconsin (WI) between 1979 and April 2012, published previously in full detail[5]. The dataset includes 486 wolves fitted with collars by the Wisconsin Department of Natural Resources (WDNR) or its agents, plus 27 collared wolves initially captured in the neighboring state of Michigan, which later migrated to Wisconsin (for a total n = 513 individuals).

Our dataset includes 257 wolves that were reported by the WDNR as 'lost-to-follow-up' (LTF) because they were not detected via repeated aerial telemetry. LTF may occur for various reasons: (a) individuals that have moved permanently out of telemetry range (i.e., migrants), (b) collars that stopped transmitting because of battery depletion or mechanical failure, and (c) unreported poaching followed by destruction of the transmitter (cryptic poaching). The WDNR suspended telemetry monitoring and assigned an LTF to a wolf if their personnel were unable to detect the collar signal after several months of statewide aerial or ground telemetry. However, the WDNR did not quantify telemetry effort. Dead wolves (n = 242) were recovered by the mortality signals emitted from their collars, after legal killing by management agents, or after private citizens reported a dead wolf between monitoring flights[41,42]. Some LTF wolves were subsequently recovered by means other than telemetry, such as reporting by private citizens. For these cases we used the estimated date of LTF for the endpoint (i.e., death from various causes or disappearance). For fuller treatment of disappearances, detection, and causes of individual wolf death see[5].

Estimating conditional hazards. Our analyses exploit the survival history of monitored wolves, measured in days from date of collaring until date of endpoint (i.e., date of death, last monitoring date, or end of our analysis period on April 15, 2012) for each monitored individual.

We modeled endpoint-specific hazard and subhazard in a competing risk framework, which are extensions of survival (or 'time-to-event') analyses. Survival analyses estimate 'time-to-event' functions, which describe the probability of observing a time interval (T) to an endpoint ('event') within a specified analysis time (t) that a subject was observed, such that $S(t) = P(T > t)$. Alternatively, these techniques allow for calculating the hazard function, $h_k(t)$, or the instantaneous rate of occurrence of a particular endpoint k conditional on not experiencing any endpoint until time t[30,43,44]. We also used the (conditional) hazard functions for all endpoints to estimate the probability of any endpoint up to a particular time T, i.e., the incidence over time for particular endpoints, such as LTF or death by vehicle collision, nonhuman cause, etc.

Semi-parametric, Cox proportional hazard models estimate how the endpoint-specific $h_k(t)$ changes as a function of survival time and a set of hypothetical covariates; $S(t) = e^{-h_k(t,x,\beta)}$, where x is a vector of covariates acting on the hazard, and β is a vector of their respective parameter estimates. The estimation of covariate effects on the endpoint-specific hazard is modeled as $h_k(t) = h_{0k}(t)e^{(\beta_1 x_1 + \cdots + \beta_j x_j)}$, where $h_{0k}(t)$ is an unestimated baseline hazard function (i.e., semi-parametric) and β_j represent estimates of hazard ratios (HRs) for each covariate x_j (HR < 1 represents a reduction in hazard and HR > 1 an increase in hazard).

The estimated HRs, β_j, are assumed proportional throughout the analysis time, t, (only differ multiplicatively between categorical covariate levels). Furthermore, we include time-varying effects on hazards and incidences by including interactions between covariates and monitoring time (in days) (see "Model covariates" section)[43–45]. These models allow us to estimate covariate effects on the rate of occurrence of an endpoint looking only at those wolves reaching that endpoint (so that the presence of other endpoints would not affect these estimates). Inference from hazards is limited in the presence of other endpoints competing to bring about the end of monitoring because interaction between endpoint hazards is unaccounted for. Interactions between endpoints are crucial for our tests of hypotheses that relate legal killing to poaching (i.e., illegal killing, both reported poaching and cryptic poaching through the LTF endpoint) at an individual level.

Estimating unconditional incidences. Competing risk analyses extend standard survival analysis by considering multiple endpoints simultaneously (e.g.: multiple causes of death or disappearance). These models are useful for estimating the incidence of a particular endpoint while accounting for the potential occurrence of all other competing endpoints (e.g., the incidence of wolf-poaching in the presence of other causes of death or LTF). In a competing risk framework, individuals can potentially experience one of multiple mutually exclusive endpoints at each interval T. Because only one endpoint can occur first, we refer to the endpoints as 'competing' over time, and to the respective probabilities over time as 'competing risks'.

Rather than estimating the endpoint-specific HRs, as in the Cox model explained above, competing risk analyses estimate the cumulative incidence function (CIF) for each endpoint, defined by the failure probability $Prob(T \leq t, D = k)$; the cumulative probability of endpoint k occurring over time in the presence of other competing endpoints[30,31,46]. Competing risk analysis accounts for the CIF of any endpoint being a function of all endpoint-specific hazards, $h_k(t)$, reflecting the rate of occurrence of that endpoint as well as how it is influenced by others[32].

Although CIFs can be derived by using all endpoint-specific HRs derived from Cox models, such a procedure cannot estimate the magnitude of the relative difference between covariate CIFs for each endpoint. Using Fine-Gray (FG) models instead of Cox models allows us to estimate differences in CIFs for a given endpoint conditional on covariates[31,47]. FG models are also semi-parametric (i.e., the baseline subhazard function is not estimated) and assume proportionality of subhazard functions, defined as the risk of failure at time t from endpoint k in subjects that have yet to reach an endpoint or have experienced any other endpoint[30,31,47]. Therefore, FG models estimate the subhazard functions of endpoint-specific CIFs using similar regression techniques as the Cox model (but on the subhazard rather than the hazard thus yielding SHR rather than HR for ratios that compare to a standard), but parameter interpretation changes. Subhazards are interpreted as relative incidence in the presence of other endpoints[29–31].

In sum, endpoint-specific Cox models and their HRs allow us to test the hypothesis that liberalized wolf-killing affected the rate of occurrence of any endpoint; for example, if liberalized killing increased or decreased the rate of occurrence of reported poaching or LTF. By contrast, the FG models and their SHRs allow us to account for the simultaneous presence of all competing endpoints to test if and how much liberalized killing affected the probability and incidence of reported poaching or LTF, in addition to the potential simultaneous effects of other covariates described after data preparation. CIFs allow us to visualize those effects on incidence while considering the prevalence of each endpoint in the population.

Data preparation. For wolves monitored until death, our endpoints classify the cause of death by 5 mutually exclusive causes of death similar to[5]: "collision" (trauma caused by vehicles; n = 24, 4.7%), "legal" (lethal control by management agencies; n = 32, 6.2%), "poached" (illegal human-caused killing; n = 88, 17.2%), "nonhuman" (causes unrelated to people, e.g.: other wolves or diseases; n = 77, 15.0%) and "uncertain" (uncertain cause but the wolf carcass was recovered, i.e.: difficult to discern in necropsy; n = 21, 4.1%). We added a sixth distinct category of LTF endpoint (n = 231, 45.0%, and see Supplementary Data S1) and we address 40 collared wolves missing endpoint dates (7.7%) below.

We defined the date of endpoint either as the recorded date of death for wolves monitored by telemetry until death (n = 242, 47.2% of sample) or as the date of last telemetry contact for LTF wolves (n = 231, 45.0%). Some of the LTF wolves were found dead later (n = 51), through means other than telemetry (e.g., visual detection), which might bias to a later date of 'death', if carcasses were found long after the actual date of death which was not uncommon[5]. Given the sensitivity of time-to-event models to the accuracy of endpoint dates and because most (n = 206, 78% of the LTF subsample) were never detected again, our step to restrict the record histories of LTF wolves to the last date of monitoring is an important yet imperfect improvement in measurement precision.

Accounting for all individuals at risk of experiencing an endpoint at any particular time T (the 'risk set') is essential for obtaining unbiased estimates of HR, SHR, and CIF[43,44,48]. Omitting a class of individuals (e.g., LTF) strongly biased risk estimates for four populations of wolves, and in the Wisconsin wolf population specifically, as summarized above[5,9].

Model covariates. We included three time-dependent categorical covariates in our models. Time-dependent covariates are variables that change value due to external events at a known date, either for individual wolves or all wolves. For example, we modeled policy period as time-dependent by changing the covariate value at the dates of policy change for a particular individual's history of monitoring. To assign categorical values of the time-dependent covariates to each monitored wolf, we split each history at each specified date of change in covariate value. We refer to the splits for a monitored wolf as 'spells', because they refer to briefer time periods within an individual's total monitoring time T. So, the time-dependent categorical covariates have a duration that overlaps the monitoring period for collared wolves during that period, but the wolves have individual spells that might be less than or equal to the duration (see example in Supplementary Table S1).

Our main covariate of interest is policy that liberalized wolf-killing (*lib_kill* where 1 = liberalized killing, 0 = full protection). Gray wolves experienced full protection under the ESA from 1979 to March 31, 2003. From April 1, 2003, wolves in WI and MI were subject to 11 alternating sequential, non-overlapping periods in which wolf-killing policies were first liberalized and then restricted for varied durations (Supplementary Table S2)[5,12,28]. Although WDNR or its agents occasionally killed a wolf during full protection periods, in capture-related accidents or after verified threats to human safety, these were rare and few. By contrast, liberalized killing periods were characterized by an announcement of policy change that allowed managers or private landowners to kill wolves for perceived or verified losses of domestic animals. Liberalized killing periods included:

- 'Downlisting' to threatened status (one period starting April 1, 2003; 670 days, Supplementary Table S2)—allows for lethal control in defense of human property or safety as well as for population management or conservation purposes under ESA section Rule 4(d).
- Issuing of sub-permits for "take" ("to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" [ESA]) of wolves by managers and sometimes private landowners (periods within 2005 and 2006; 263 days, Supplementary Table S2) under ESA sections 9 and 10.
- 'Delisting', or removing ESA protections entirely (periods of 2007, 2009 and 2012; 701 days, Supplementary Table S2).

Choosing to end our study on April 14, 2012 presented several advantages. First, the WDNR summarized wolf census data and population reports for the preceding year on April 15th. Second, we could compare our results to prior work[12,21,49]. Third, the April 2012 passage of Act 169 enacting the first wolf-hunting seasons since wolf

bounties were terminated in the 1950s[50] was a qualitatively different policy signal than those of the liberalized killing periods (Supplementary Table S2).

Our second binary covariate, *winter,* produced spells for October–March ('1', winter) and April-September ('0', summer). Our inclusion of this variable is warranted by robust independent evidence of seasonal differences in both overall and endpoint-specific mortality[21,51,52]. Most LTF endpoints occurred during winter months (143/231 = 62% of LTF wolves, with n = 40 wolves censored).

Our third covariate had three levels for periods with different methods of censusing wolves (*method_change*). In the winter of 1994–1995 the wolf census methods changed, and did so again sometime between summer 2000 and winter 2003–2004, with changes in monitoring techniques and protocols for data handling[18,23]. Those changes affected effort and training of wolf census-takers, so might have affected the detection and monitoring effort for collared wolves also. Although there is some ambiguity in the literature over the exact dates of these changes, we opted for the following splits based on year of endpoint: 1979–1994 ('1'), 1995–2000 ('2') and 2001–2012 ('3').

Imputation for 2012 records without endpoint data. We right-censored the interval for individuals that did not experience an endpoint during the analysis period (start of monitoring until April 14, 2012), meaning they are considered as part of the risk set from collaring until the end of the analysis period. Our dataset includes 40 wolves without attributed mortality of disappearance data, because we could not find their endpoint (i.e., cause of death or disappearance) in public records after December 31st, 2011 (see supplementary data files for WDNR monitoring records for 2012 and 2013). Although 14 of those 40 wolves were later found dead in mortality reports between May 2012 and October 2013 (Supplementary Data S2), those reports did not reveal the last date of monitoring but rather a lengthy interval without a record of monitoring followed by discovery of the dead animal. Therefore, we conservatively censored those 14 wolves at April 14, 2012 to consider them as within the risk set (monitored) for the corresponding time intervals, yet without experiencing an endpoint during that time. For the other 26 censored wolves that vanished from public records after December 31st, 2011, our repeated efforts to obtain data were not fulfilled by the WDNR. We submitted four separate requests to the WDNR (1 open records request, 1 state Natural Heritage Inventory request, a personal request to research staff who have published analyses with those data, and we enlisted the aid of the lieutenant governor and governor's offices to request those data) for all collared wolves monitored in the state in 2012. Therefore, we simulated their endpoints in three scenarios described below.

We imputed either an LTF or censored status to the $n = 26$ wolves with missing endpoints based on the rationale that if any of these monitored wolves had suffered a death rather than a disappearance, their deaths should have appeared in mortality records spanning January 1, 2012 (when missing records for these wolves begin) to October 31, 2013, as happened with the 14 wolves with missing endpoint but found in subsequent mortality reports and therefore censored. Thus, the two remaining possibilities are that these wolves were either LTF or survived our analysis period and beyond October 31, 2013 which means they must be included in the risk set but be censored for endpoint analyses because they do not fit our 6 categories of endpoint.

For our simulation scenarios, we developed a series of FG imputation models (IMs) with LTF as the endpoint of interest using the above covariates for the full, original dataset (i.e., with all 40 wolves with missing data classified as 'censored' on April 14, 2012). We then used the most appropriate FG model (accounting for Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), log-likelihood (LL), parsimony and proportionality assumptions) to predict the probability of LTF incidence by April 14, 2012 for each of the 26 wolves. Because we assumed all 26 wolves were alive on April 14, 2012 (i.e., each is imputed their maximum *survival* time) for all models, whereas they might actually have disappeared earlier in 2012, our approach is conservative because it likely underestimates the relative incidence of LTF.

To calculate each of the 26 wolves' probability of LTF, we first calculated the baseline CIF for the best IM and multiplied it by the exponentiated *lib_kill* and *winter* coefficients in Model 2 to obtain a probability of LTF for each wolf during winter periods with liberalized killing, as wolves experienced during the period beginning January 28, 2012 until April 14, 2012 (Supplementary Table S2). Then we ran 1,000 simulations for each wolf going LTF, using a Bernoulli distribution with the LTF probability for each wolf as the probability of success ('LTF'). For our MAIN imputation scenario, each wolf was imputed an LTF endpoint (on April 14, 2012) if the simulated occurrence of the LTF endpoint was higher than the probability of LTF predicted from the FG model (used as an imputation threshold), $p_{i,SIM}(ltf) > p_{i,FG}(ltf)$, otherwise we censored that wolf. To analyze sensitivity to the MAIN scenario, we also developed HIGH and LOW scenarios following a similar imputation process (Supplementary Data S3). For the HIGH imputation scenario, we increased the threshold probability for going LTF by half the difference between $p_{i,FG}(ltf)$ and 1; $p_{i,HI}(ltf) = p_{i,FG}(ltf) + (1 - p_{i,FG}(ltf)/2$. For the LOW imputation scenario, we decreased the threshold probability for going LTF by half of $p_{i,FG}(ltf)$; $p_{i,LO}(ltf) = p_{i,FG}(ltf) - p_{i,FG}(ltf)/2$. The LOW and HIGH scenarios provided bounds on the point estimates of relative hazard and incidence for the simulated LTF process in the MAIN scenario.

Statistical tests. To model all endpoint-specific HRs, we employed Lunn & McNeil's (1995 Method B) data augmentation method. Namely, we augmented the data by our 6 endpoint categories and employed stratified joint Cox multiple regression (on endpoint) with interactions between covariates and each endpoint. Our initial model included all interactions. We then discarded the weakest first to follow model selection procedures while retaining the policy variable in all models (7 models total, Supplementary Table S5). The approach provides us with covariate HRs for all endpoints and we use those HRs for estimating the CIFs by policy period for each endpoint. We model HR distributions of covariates for our poaching and LTF by exponentiating a normal distribution parameterized with the covariate coefficients and standard deviations obtained from their respective Cox models.

We also ran separate FG univariate and multivariate models, which mirrored the best stratified joint Cox model, to estimate FG CIFs for each endpoint. We compared CIFs visually to identify the most appropriate CIF model estimate (Cox or FG), following[53].

Given the complete survival history of each individual wolf was split into multiple spells, we clustered all our regression analyses using a unique identifier for each wolf, following methods in[54]. Clustering on wolf identity accounts for auto-correlation (e.g., all spells are analyzed within-subjects) and avoids pseudo-replication of observations. We evaluated compliance with the proportionality assumptions for each model through the inclusion of time-varying coefficients (tvc). A tvc is an interaction of each parameter with analysis time which models changes in that parameter's effect over time; i.e., non-proportionality. Endpoint-specific models with significant non-proportionality in a covariate (tvc) cannot provide predictions of risk or incidence due to computational limitations. We further verified proportionality using Schoenfeld residuals[43,44,48], which should show a random pattern against time as evidence of compliance with the PH assumption. We selected the best regression models considering AIC, BIC, LL, parsimony, and compliance with model assumptions. When we set aside a best model because of non-proportionality, we present and discuss the best model but our CIF calculations use parameters from the same Cox or FG model without the tvc. We visually assessed goodness-of-fit for each selected endpoint-specific Cox model by Cox-Snell residual plots, which should show the Nelson-Aalen cumulative hazard closely following the line of Cox-Snell residuals if the model is a good fit. We conducted all statistical analyses in Stata 15 (StatCorp, College Station, TX, 2015; see supplementary materials for statistical code).

Data availability

All data and statistical code is available in the main text, supplementary materials or from [INSTITUTIONAL DATA REPOSITORY].

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Author contributions

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Competing interests

FSA and RJC declare no competing interests. AT declares no competing interests, and provides his CV (https://faculty.nelson.wisc.edu/treves/archive_BAS/Treves_vita_Jan2020.pdf) and all funding awarded as of 6 Jan 2020 (https://faculty.nelson.wisc.edu/treves/archive_BAS/funding.pdf) for transparency, so readers can decide if they perceive a competing interest.

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Human-caused mortality triggers pack instability in gray wolves

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Transboundary movement of wildlife results in some of the most complicated and unresolved wildlife management issues across the globe. Depending on the location and managing agency, gray wolf (*Canis lupus*) management in the US ranges from preservation to limited hunting to population reduction. Most wildlife studies focus on population size and growth rate to inform management, but relatively few examine species biological processes at scales aside from that of the population. This is especially important for group-living species such as the gray wolf, for which the breeding unit is the social group. We analyzed data for gray wolf packs living primarily within several US National Park Service units (years of data): Denali National Park and Preserve (33 years), Grand Teton National Park (23 years), Voyageurs National Park (12 years), Yellowstone National Park (27 years), and Yukon-Charley Rivers National Preserve (23 years). We identified two gray wolf biological processes that differed from population size – namely, pack persistence and reproduction – and determined that while human-caused mortality had negative effects on both, pack size had a moderating effect on the impacts of mortality.

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Gray wolf (*Canis lupus*) management strategies in the US have ranged from eradication by any means (Musiani and Paquet 2004), to protection and recovery under the Endangered Species Act (Fritts *et al.* 1997), to state-level management, which can include predator control and hunting seasons (Ausband 2016; Schmidt *et al.* 2017; Parks *et al.* 2022; Mills 2022). This array of management approaches exemplifies long-standing human attitudes toward wolves, where management decisions have been implemented to reduce wolf–human conflict and often to align with varying levels of social tolerance toward wolves. Wolves also require extensive areas and regularly move across jurisdictional boundaries (Smith *et al.* 2016; Hebblewhite and Whittington 2020), where transboundary wildlife management issues are often complicated by conflicting managing agency goals or mandates. Most agency management objectives include target population and harvest numbers, and wildlife research has largely focused on the human impacts on these factors. Relatively few studies have examined the effects of human disturbance to biological metrics other than the population size or growth rate such as sex ratios, age structure, and social structure, yet several have reported notable impacts. For example, infanticide increased with male harvest in both African lions (*Panthera leo*) (Loveridge *et al.* 2007) and Scandinavian brown bears (*Ursus arctos*) (Leclerc *et al.* 2017), and human-caused mortality disrupted dispersal patterns in African leopards (*Panthera pardus pardus*), resulting in higher rates of inbreeding (Naude *et al.* 2020).

Gray wolves have been researched extensively and many management decisions at the state level (Horne *et al.* 2019; Mills 2022; Parks *et al.* 2022) are based on studies examining the influence of human-caused mortality on population growth rate (Fuller *et al.* 2003; Adams *et al.* 2008; Creel and Rotella 2010). However, wolf populations are composed of distinct packs, making the pack a vital unit of measure, particularly in relation to social structure and pack-level success in hunting, reproduction, disease recovery, foraging, and territoriality (Smith *et al.* 2020). Among the first to examine the impact of disturbances at the pack level, Brainerd *et al.* (2008) found that the loss of breeding wolves (hereafter, "breeders") had major implications for the rest of the pack; expanding on this work, Borg *et al.* (2015) reported that the loss of the female breeder was especially detrimental to pack maintenance. Gray wolf harvest also has impacts on demographics, such that harvest decreased recruitment beyond the number of pups directly harvested (Ausband *et al.* 2015), and survival was driven by wolf use of protected areas (Hebblewhite and Whittington 2020). Focusing on human impacts, Rutledge *et al.* (2010) found that reducing human-caused gray wolf mortality restored the natural structure of wolf packs composed of close kin, and Bryan *et al.* (2015) found that wolves in areas with heavy hunting pressure had higher levels of stress hormones. Our study focused on wolf pack-level biological processes for wolves living primarily in several US national parks.

National parks in the US are managed by the federal Department of the Interior and have a preservation mission that affords species and natural processes the highest level of protection from human impacts (Dudley 2008). The National Park Service (NPS) Organic Act lists "natural and historic

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objects, and wildlife" as park resources subject to the no-impairment standard (NPS 1916). Further NPS guidance describes park resources as including "ecological, biological, and physical processes" (NPS 2011). Gray wolf biological processes are well studied but have not been officially defined for the NPS. Wolves cooperate in packs to achieve several critical milestones each year in order to persist: breeding in late winter, producing pups in early spring, and raising pups to recruitment. They also cooperate to maintain pack size, defend territory, and find prey throughout the year. Pack size and structure, territorial movements, reproduction, and pack persistence are therefore potential criteria for measuring gray wolf biological processes and determining human impacts.

We examined wolf data from five US national parks and preserves (hereafter, "parks"): Denali National Park and Preserve (DNPP, 33 years of data: 1986–2019), Grand Teton National Park (GTNP, 23 years of data: 1998–2021), Voyageurs National Park (VNP, 12 years of data: 1987–1991 and 2013–2021), Yellowstone National Park (YNP, 27 years of data: 1995–2022), and Yukon-Charley Rivers National Preserve (YCRNP, 23 years of data: 1993–2016). We report human-caused mortalities for wolves living primarily in these units, measured as the total mortalities attributed to harvest, lethal control, poaching, vehicle strikes, and capture. We determined the consequences of human-caused wolf mortalities on two measures of gray wolf biological processes – pack persistence and reproduction – and discuss the status of these biological processes as they relate to protected areas and transboundary management.

Methods

Data collection

All five of the study areas (WebFigure 1) consisted of parks within the historical and current gray wolf range in the US. Each park had a gray wolf research program and the duration and intensity of these programs varied. The parks ranged in size and extent of road access, as well as the number of land and wildlife managing agencies with which they share boundaries (WebTable 1).

Wolf monitoring effort, specific to the data needed for this study, varied little between parks. Each park used radio collaring and aerial tracking throughout the year to record pack movements, size, composition, and reproduction. Monitoring pack composition determined the presence of pups and the identities of pack breeders and leaders. Pack breeders generally are the pack leaders (formerly called alphas), and each pack usually has one male breeder and one female breeder (Mech and Boitani 2003), with the exception of packs in YNP, where subordinate breeders often occur. As a result, YNP recorded pack leaders in addition to breeders (Smith *et al.* 2020). Breeders in the other four parks were referred to as leaders in this analysis. Aerial locations were supplemented with ground observations using spotting scopes or trail cameras. Wolf pack territory configurations varied, with some occurring completely within the boundaries of the park, some occasionally traveling outside the park, and some frequently traveling beyond park boundaries.

Wolf mortalities were identified directly and when a collar emitted a mortality mode after a period of time with no movement. In some cases, mortality data were collected on uncollared wolf carcasses found by or reported to park staff. Cause of death was determined through necropsies performed by staff or by reports from hunters or other wildlife officials.

Data analysis

For wolves in the five parks, we summarized the extent of human-caused mortalities as compared to natural mortalities, and also summarized the breakdown of human-caused mortalities by specific cause: harvest, lethal control, poaching, vehicle strike, or capture (either a fatal reaction to the capture drugs or an accidental, natural death while under the effects of the capture drugs – for instance, being killed by other wolves or bison). We examined pack-years, measured from the spring count just prior to the birth of new pups to the following spring (one biological year). We calculated the proportion of packs that persisted to the end of the biological year and reproduced the spring following the focal biological year ($y+1$) for packs with zero human-caused mortalities and packs with at least one human-caused mortality. We used z-tests to assess the statistical significance between the proportion of packs that persisted and reproduced with no recorded human-caused mortalities as compared to packs with at least one recorded human-caused mortality.

To determine the effect of human-caused mortality on pack persistence and reproduction, we used generalized linear mixed models (GLMMs) with a binomial distribution via the program STATA (Stata Corporation; College Station, TX). We measured pack persistence by determining when a pack formed and dissolved, with persistence marked as Yes (1) for all years until the dissolution year, which was marked as No (0). Dissolution was defined as pack size dropping below two resident wolves. Lone wolves were not considered a pack and often roamed widely without a territory (Mech and Boitani 2003). Reproduction was documented each spring and recorded as Yes (1) based on consistent pack movements around a den or observation of at least one pup. Reproduction was recorded as No (0) if the pack did not localize and no pups were observed. If a pack did not persist to the end of the biological year (persist = 0), it could not reproduce the following year (reproduce = 0).

Pack size was determined at several points throughout the year based on aerial and ground observations or extrapolated from a prior or later count, depending on each park's seasonal monitoring effort (WebPanel 1). To account for repeated measures and for unmeasured variables, we included two random intercepts: pack name (because territory location will change the human-related hazards for certain packs more than others) and year (because wolf management outside of protected areas sometimes changed from year to year). We considered park name as a random

variable. However, after applying *z*-tests to evaluate differences between persistence and reproduction by park, we found the park name variable to be unimportant. Pack name was a more fine-scale measure of risk so we dropped the coarser variable, park name, from the models.

Previous studies have examined if human-caused mortalities in gray wolf populations are additive or compensatory (Creel and Rotella 2010; Murray *et al.* 2010). In our study, we examined human-caused mortalities at the pack level only. Packs with no human-caused mortalities likely experienced natural mortalities, and packs with different levels of human-caused mortality experienced either similar (additive) or different levels of natural mortality (compensatory). Additive or compensatory mortality are both possible, but the interaction between these two mortality factors is beyond the scope of this study.

We compared several GLMMs using an information-theoretic approach (Burnham and Anderson 2004) with (1) a NULL model (persistence or reproduction best explained by random intercepts only) and (2) a univariate model of PACKSIZE. Pack size is important to all aspects of wolf life history (Mech and Boitani 2003; Smith *et al.* 2020), and therefore we included it in all other models: (3) PACKSIZE and TOTALMORT (all recorded human-caused mortalities in a given biological pack-year), (4) PACKSIZE and LEADERMORT (human-caused mortalities of pack leader), and (5) PACKSIZE, TOTALMORT, and LEADERMORT. On the basis of the best-performing models, we constructed fitted-value plots for the predicted probability that a wolf pack would persist and the predicted probability that a wolf pack would reproduce.

Results

Across all five parks, we monitored 193 packs over 864 pack-years and recorded 978 wolf mortalities from 1986 to 2021. On average, 5.3% of each pack died from a human-related cause each year (standard deviation [SD] = 17.2%), with no recorded human-caused mortalities in 80% of the pack-years and 1.6% of pack-years resulting in the deaths of the entire pack from human causes. The proportion of mortalities of collared wolves caused by humans ranged by park from 22 to 58% (Figure 1a) and these mortalities were

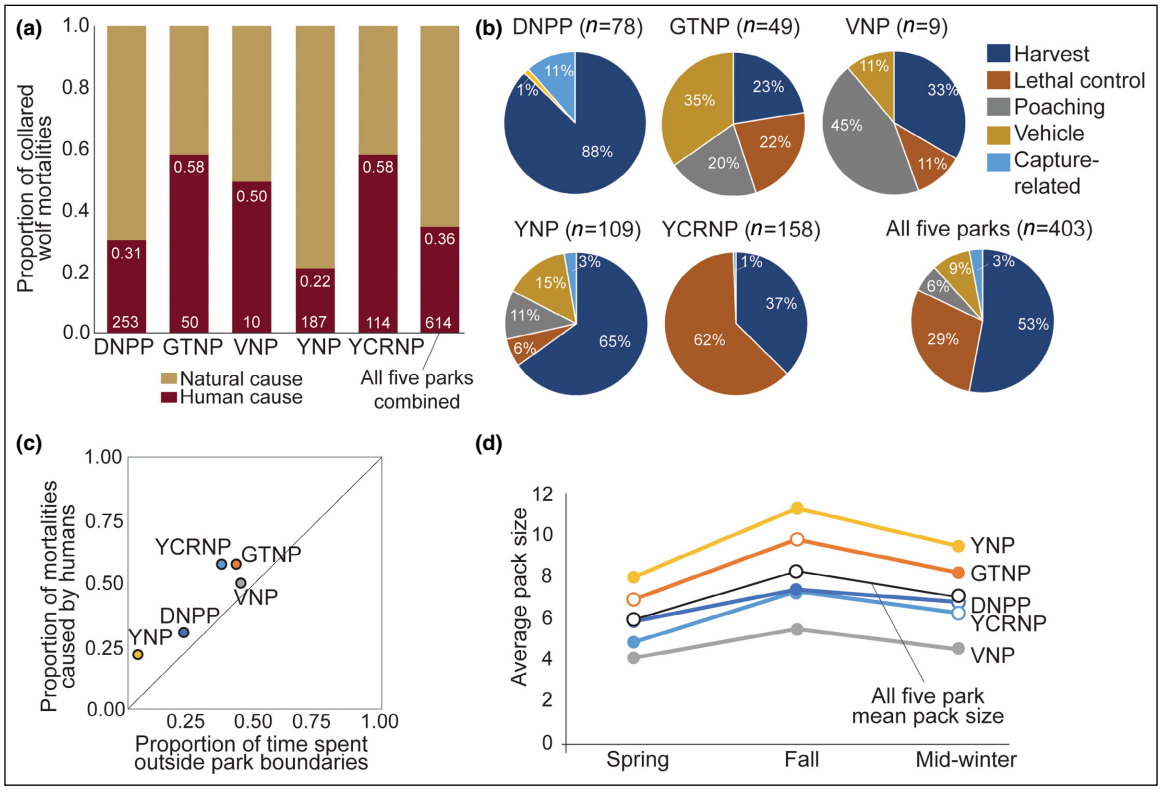

Figure 1. Gray wolf (*Canis lupus*) mortalities and pack information from 1986 to 2021 in five US national parks and preserves: Denali National Park and Preserve (DNPP), Grand Teton National Park (GTNP), Voyageurs National Park (VNP), Yellowstone National Park (YNP), and Yukon-Charley Rivers National Preserve (YCRNP). (a) Collared wolf mortalities, known-cause only, with causes of death separated into natural causes or human-caused. Total sample sizes are displayed at the bottom of each bar and the proportion of human-caused mortalities is displayed at the top of each red bar. (b) Cause-specific mortality for all human-caused mortalities (collared and uncollared wolves), with sample sizes in parentheses. Note that mortality proportions do not represent relative risk exposure. (c) Plotted points for the proportion of time that monitored wolves spent outside park boundaries by the proportion of collared wolf mortalities attributed to human-caused causes, with a 1:1 reference line. (d) Average pack size at three times of the year for each park: spring before pups are born, fall prior to most hunting and trapping seasons, and mid-winter. Solid circles indicate an official count performed by each park; in instances where pack size was not officially measured, estimates were calculated (open circles) (WebPanel 1).

categorized into five specific causes (Figure 1b). The proportion of human-caused mortalities was higher than the proportion of time wolves spent outside park boundaries (Figure 1c). Average pack size also varied between parks (Figure 1d).

Packs with no reported human-caused mortalities persisted to the end of the biological year 91.6% of the time, while packs that experienced at least one reported human-caused mortality persisted 76.3% of the time (z-score = 5.602, $P < 0.0001$) (Figure 2a). Packs with no reported human-caused mortalities reproduced the following year 79.0% of the time, whereas packs with at least one reported human-caused mortality reproduced the following year only 65.6% of the time (z-score = 3.540, $P < 0.001$) (Figure 2b).

Persistence model results

The best-performing model for determining pack persistence (WebTables 2 and 3) included pack size, total human-caused mortalities, and human-caused mortality of a leader (AICc weight [w_i] = 0.97, where AICc is Akaike's Information Criterion corrected for sample size). Pack size in the fall (coefficient estimate [β] = 0.229, 95% confidence interval [CI]: 0.159 to 0.300) was an important factor, and persistence increased with pack size. Pack persistence decreased with increasing human-caused mortalities (β = –0.309, 95% CI: –0.589 to –0.030). Packs with at least one human-caused mortality had a 27% lower likelihood of persisting (odds ratio 0.73 = exp[–0.309]). The human-caused mortality of a leader (β = –1.239, 95% CI: –1.931 to –0.548) had an even greater effect on pack persistence, causing a 71% lower likelihood of persisting.

We used the best-performing model to predict persistence based on pack size and human-caused total and leader mortalities (Figure 3a). Among packs that had no human-caused mortalities, persistence was initially moderately high for the smallest packs (0.79 for a pair of wolves) and increased to >0.90 for packs larger than six members. A pack of eight (average fall pack size for all parks combined) was very likely to persist (probability: 0.94) with no mortalities, but became less likely to persist with each additional mortality (five mortalities = 0.76 persistence probability). The effect was stronger if the human-caused mortality was a leader (one leader = 0.76, two leaders = 0.38).

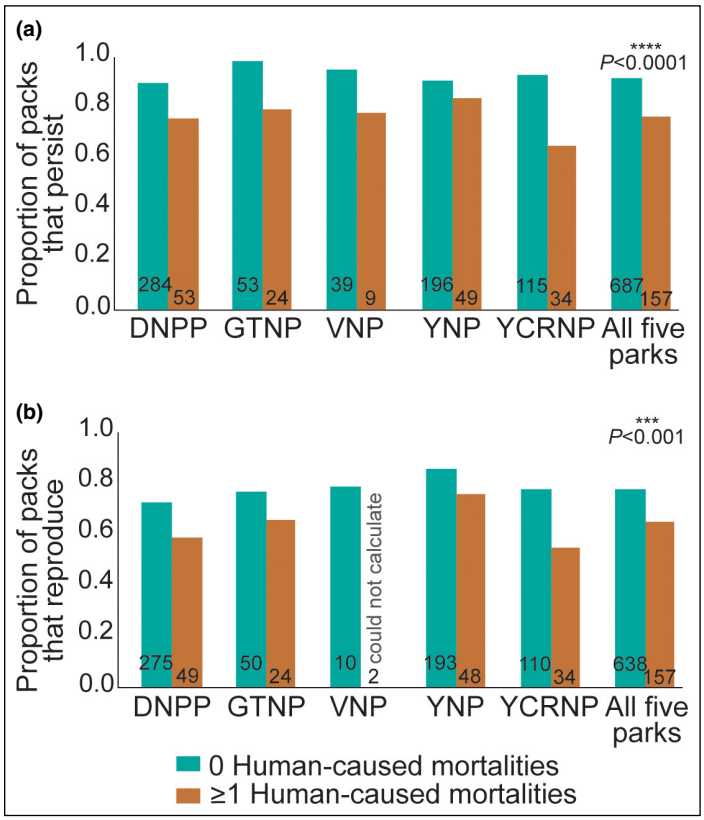

Figure 2. Proportion of gray wolf packs without human-caused mortality (green bars) and with one or more recorded human-caused mortalities (orange bars) that (a) persisted to the end of the biological year and (b) reproduced after the biological year, in five US national parks and preserves. Pack-years are indicated at the bottom of the bars and P values for the z-scores are shown above the bars for all five parks and preserves combined.

Reproduction model results

The best-performing model for determining reproduction (WebTables 4 and 5) included pack size, total human-caused mortalities, and human-caused mortality of a leader (w_i = 0.94). Pack size (β = 0.173, 95% CI: 0.129 to 0.217) indicated larger packs were more likely to reproduce than small packs. Any human-caused mortality (β = –0.254, 95% CI: –0.484 to –0.024) and human-caused mortality of a leader (β = –0.674, 95% CI: –1.282 to –0.066) were also important variables, with a leader mortality having a greater effect than that of any mortality (49% versus 22% lower likelihood of reproducing, respectively).

We used the best-performing model to predict reproduction based on pack size, total human-caused mortalities, and human-caused leader mortalities (Figure 3b). The probability of reproduction for a pack with no human-caused mortalities started at 0.59 for wolf pairs and increased to >0.90 at pack sizes over 13. For a pack of eight with no human-caused mortalities, the predicted probability of reproducing was 0.8 and fell by 0.04 to 0.07 with each additional total mortality. The mortality of one leader or two leaders from a pack of eight decreased the probability of reproducing to 0.61 and 0.37, respectively.

Discussion

In this study, we quantified the extent and impact of human-caused mortality on two gray wolf biological processes – pack persistence and reproduction – in five US national parks and preserves. Human-caused mortality accounted for 36% of collared wolf mortalities and had a detrimental effect

on both pack persistence and reproduction. The human-caused mortality of any wolf decreased the predicted odds of pack persistence to the end of the biological year by 27% (1: 0.73) and reproduction the following year by 22% (1: 0.78). The human-caused mortality of a pack leader decreased the predicted odds of pack persistence to the end of the biological year by 73% (1: 0.27) and reproduction the following year by 49% (1: 0.51). These results indicate that human activities can have major negative effects on the biological processes of wildlife that use protected areas.

Many studies have focused on gray wolf population-level metrics such as population size and growth rate. Although wolves seem to be well equipped to recover from fairly high levels of human offtake (Fuller *et al.* 2003; Adams *et al.* 2008), given their short time to sexual maturity and ability to produce large litters, these measures of recovery are at the population level and can disguise disruption occurring at the pack level. The pack-level measures we examined show that even the loss of a single wolf, especially a leader, can have detrimental effects on the pack. This aligns with the findings of Brainerd *et al.* (2008) and Borg *et al.* (2015) on pack persistence and mortalities. In addition, pack instability not only could possibly lead to disruptions to wolf pack kin structure (Rutledge *et al.* 2010) or even population-level perturbation, as it does for other species (Lerch *et al.* 2018), but also is an important topic for future research. Our results also show an effect on reproduction; when combined with lower recruitment after a harvest mortality in the pack (Ausband *et al.* 2015), these results warrant future attention on this vital population and pack-level measure.

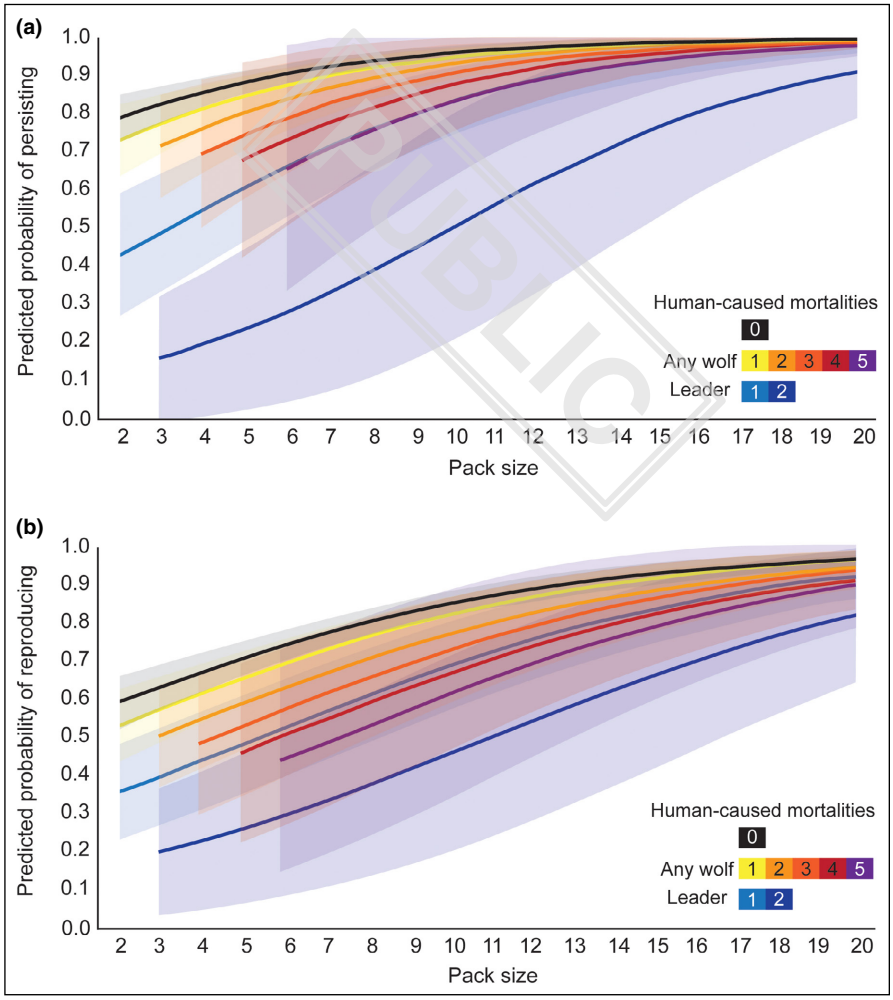

Figure 3. Predicted probabilities of a gray wolf pack (a) persisting and (b) reproducing in five US national parks and preserves based on the best-performing generalized linear mixed models.

Although pack dissolutions are natural components of gray wolf life history, our results demonstrate that these events can be influenced by human-caused mortalities. As our primary goal was to report the extent and consequence of human-caused mortality on packs, we did not examine the relationship between additive and compensatory mortality as it relates to human and natural causes at the population level. However, our results indicate that even in the unlikely case that human-caused mortality was completely compensatory, pack persistence and reproduction was still negatively impacted. This may be due to human-caused mortalities occurring at more critical times of the year for wolf biological processes, such as during the months of wolf pregnancy, or are more likely to occur in clusters (more than one wolf killed) than natural mortality. In addition, in areas with an adequate wolf population, new or neighboring packs often claim the territory of a pack that dissolves. This dynamic is evident in the differences between population-level studies, where human impacts might be minimal, and pack-level studies like this one, where human impacts can be consequential. Overall, wolf population abundance can remain stable concurrent to negative impacts on wolf social dynamics at the pack level. For wildlife managing agencies solely concerned with population-level metrics, our results showing pack-level disruption by humans may not alter policy, as population numbers may remain unchanged even with major pack turnover. However, human impacts at the pack level are of concern to agencies and organizations with goals of natural regulation and preservation of biological processes.

Pack size had a moderating effect on both pack persistence and reproduction, with larger packs better able to recover from the impacts of human-caused mortalities. Wolf pack size is critical to nearly every aspect of wolf life history, from hunting prey to raising pups to recovering from disease (Smith *et al.* 2020). Furthermore, a pack-level negative feedback loop has been found in other canids, where packs reduced to a certain size

cannot recover and eventually dissolve (Courchamp and Macdonald 2001). Human-caused mortality could have impacts beyond our focus on persistence and reproduction by reducing pack size and limiting the success or efficiency of the many biological processes dependent on pack size.

The timing and extent of transboundary movements and wolf management goals outside of national parks may reduce the sizes of packs primarily using parks, as it does for packs outside of parks (Sells *et al.* 2022). For example, recent regulations in western states (Montana and Idaho) aim to reduce wolf populations. As a result, the average harvest mortality of wolves that primarily used YNP but showed some transboundary movements, previously 4.3 per year (2009, 2011–2020), increased to at least 25 wolves (19% of the YNP wolf count) in the 2021–2022 biological year. This 480% increase contributed to the dissolution of two packs and reduced pack sizes for five of the other six packs using YNP.

Wildlife such as gray wolves and the processes and conditions that maintain them are park resources and values that are subject to the no-impairment standard (NPS 1916, 2011). Transboundary agreements between national parks and neighboring land and wildlife management agencies are critical to the management of gray wolves and ideally reflect the level of transboundary movements for each park and/or pack. We found that humans caused 22–58% of known collared wolf deaths during the 4–43% of the time wolves spent outside the parks. We recommend efforts be made to ensure that the proportion of human-caused mortalities more closely matches the proportion of time wolves spend outside park boundaries. Limiting human-caused mortalities is possible if efforts are made toward cooperative interagency goals. Specifically, jurisdictions adjacent to parks could adjust hunting seasons and lethal control near parks to accommodate cross-boundary movements and stability of packs.

In addition to interagency collaboration, parks can work within park boundaries to reduce other types of human-caused mortalities. For instance, as vehicle strikes composed 9% of human-caused mortalities, areas within parks where road mortalities are most frequent can be identified and the feasibility of implementing mitigating strategies, such as reduced speed limits or crossing structures, can be assessed. Poaching (6%) may be reduced if law enforcement is provided adequate staffing and resources and if legal consequences for poaching are severe. Parks can also help wolves maintain wild behavior, through hazing and aversive conditioning when necessary, to prevent habituation to vehicles and people, ideally without damaging wolf viewing opportunities for visitor enjoyment. These efforts should reduce human-caused mortalities by reducing wolves' susceptibility to harvest, poaching, and vehicle strikes.

Conclusion

Gray wolf management is rarely simple and transboundary wildlife issues are complicated by disparate management goals (Smith *et al.* 2016). Despite our study focusing on gray wolves that primarily lived within national parks and preserves, we documented high levels of human-caused mortality, most of which occurred outside protected-area boundaries. Of greater concern, these mortalities had detrimental effects on gray wolf pack-level biological processes. Rather than viewing this result as a failing, we hope this work encourages a renewed interest in interagency collaboration, where management of gray wolves is defined by compromise and based on science, including weighted space-use and cause-specific mortality data. If efforts are made toward this goal, these protected areas and the partners involved can serve as a model for successful transboundary issues worldwide.

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Data Availability Statement

Data are available through Dryad (https://doi.org/10.5061/dryad.mkkwh713f). No novel code was used for this manuscript.

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Management and Conservation Article

The Effects of Breeder Loss on Wolves

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ABSTRACT Managers of recovering wolf (*Canis lupus*) populations require knowledge regarding the potential impacts caused by the loss of territorial, breeding wolves when devising plans that aim to balance population goals with human concerns. Although ecologists have studied wolves extensively, we lack an understanding of this phenomenon as published records are sparse. Therefore, we pooled data ($n = 134$ cases) on 148 territorial breeding wolves (75 M and 73 F) from our research and published accounts to assess the impacts of breeder loss on wolf pup survival, reproduction, and territorial social groups. In 58 of 71 cases (84%), ≥1 pup survived, and the number or sex of remaining breeders (including multiple breeders) did not influence pup survival. Pups survived more frequently in groups of ≥6 wolves (90%) compared with smaller groups (68%). Auxiliary nonbreeders benefited pup survival, with pups surviving in 92% of cases where auxiliaries were present and 64% where they were absent. Logistic regression analysis indicated that the number of adult-sized wolves remaining after breeder loss, along with pup age, had the greatest influence on pup survival. Territorial wolves reproduced the following season in 47% of cases, and a greater proportion reproduced where one breeder had to be replaced (56%) versus cases where both breeders had to be replaced (9%). Group size was greater for wolves that reproduced the following season compared with those that did not reproduce. Large recolonizing (>75 wolves) and saturated wolf populations had similar times to breeder replacement and next reproduction, which was about half that for small recolonizing (≤75 wolves) populations. We found inverse relationships between recolonizing population size and time to breeder replacement ($r = -0.37$) and time to next reproduction ($r = -0.36$). Time to breeder replacement correlated strongly with time to next reproduction ($r = 0.97$). Wolf social groups dissolved and abandoned their territories subsequent to breeder loss in 38% of cases. Where groups dissolved, wolves reestablished territories in 53% of cases, and neighboring wolves usurped territories in an additional 21% of cases. Fewer groups dissolved where breeders remained (26%) versus cases where breeders were absent (85%). Group size after breeder loss was smaller where groups dissolved versus cases where groups did not dissolve. To minimize negative impacts, we recommend that managers of recolonizing wolf populations limit lethal control to solitary individuals or territorial pairs where possible, because selective removal of pack members can be difficult. When reproductive packs are to be managed, we recommend that managers only remove wolves from reproductive packs when pups are ≥6 months old and packs contain ≥6 members (including ≥3 ad-sized wolves). Ideally, such packs should be close to neighboring packs and occur within larger (≥75 wolves) recolonizing populations. (JOURNAL OF WILDLIFE MANAGEMENT 72(1):89–98; 2008)

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Changes in human attitudes and government policies have enabled wolf (*Canis lupus*) to be restored to portions of its former range in North America and Europe (Mech 1995*a*, Boitani 2003, Musiani and Paquet 2004). A dilemma for biologists responsible for managing populations of recolonizing wolves is the need to balance long-term population viability with the immediate necessity of limiting conflicts between people and wolves (Mech 1995*a*, Chapron et al. 2003). Recent studies indicate that local involvement in wolf management, including public hunts, can help reduce conflicts and perhaps increase local acceptance of wolves (Andersen et al. 2003, Ericsson et al. 2004). Removal of territorial wolves that cause conflicts with local human

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populations through livestock depredation or other undesirable behavior may sometimes be a necessary measure for managing recolonizing wolf populations (Mech 1995*a*, 2001; Fritts et al. 2003; Bangs et al. 2004, 2005). In this context, it is important for managers to understand effects breeder loss may have on wolf social groups relative to goals and strategies for population recovery and long-term viability, as well as ethical and animal welfare considerations.

We lack an understanding of the effects of loss of breeding wolves because published records are sparse and largely anecdotal (e.g., Mech and Boitani 2003). Thus, our objective was to assess the effects of breeder loss on territorial wolves by pooling available data. We hypothesized that breeder loss would negatively impact pup survival and reproduction within territories, as well as group integrity and territoriality. In this context, we examined how group composition and size, timing of loss, and population size and type (recolonizing vs. saturated) influenced outcomes.

STUDY AREA

We compiled data from our field studies and cases collected from the literature (Mech 1977*a*, *b*; Fritts and Mech 1981; Peterson et al. 1984; Ream et al. 1991; Boyd and Jimenez 1994; Meier et al. 1995; Jozwiak 1997; Mech et al. 1998; Table 1). For our field data, we refer to descriptions from previously published descriptions of our study areas in Alaska (Kenai: Petersen et al. 1984; Denali: Meier et al. 1995, Mech et al. 1998), the northern Rocky Mountain region of the United States (U.S. Fish and Wildlife Service 1994, Bangs et al. 1998, Oakleaf et al. 2006), Wisconsin, USA (Wydeven et al. 1995, Kohn et al. 2000), Greece (Migkli et al. 2005, Iliopoulos et al. 2006), and Scandinavia (Wabakken et al. 2001, Liberg et al. 2008).

METHODS

Data Collection

S. Brainerd, of the Scandinavian Wolf Project (SKANDULV), queried wolf biologists worldwide to request cooperation and original data for our study. We combined unpublished data respondents (coauthors) and SKANDULV with published records (Table 1). Data for some parameters, such as group sizes or specific dates of loss, were missing in some cases. Therefore, sample sizes vary among analyses.

Terminology

A breeder was a member of a mated, territorial pair that either was or had the potential to be a parent. Breeding wolves are the natural leaders of packs (Mech 1999, 2000; Peterson et al. 2002). Pup survival is defined as the frequency in which >1 pup survived the loss of breeders. The term implied that pups survived at least through the first winter after birth and up until the first birthday. We determined pup survival through observations, snow-tracking, genetic evidence (i.e., DNA markers: Liberg et al. 2005) and survival of radioinstrumented pups. We used direct observations of pups or indirect evidence (e.g., telemetry locations, genetic evidence, and snow-tracking data) to determine successful reproduction.

We defined groups as breeding pairs or packs (i.e., pups and older wolves, including breeders). We quantified group size in 3 ways: 1) preloss, which included all wolves (breeders and others) that were subsequently lost; 2) at time of breeder loss, which subtracted breeders and other wolves lost at the time of the event; and 3) postloss, which included all known mortality (including pups) after the event and before the next reproductive season.

We classified wolves as either sexually mature adults (≥22 months old), subadult yearlings (≥12 to <22 months old), and pups (<12 months old; Mech 1970). For some analyses, we combined yearlings and adults (breeders and nonbreeders) as adult-sized wolves. We defined auxiliaries as adult-sized nonbreeders (e.g., Harrington et al. 1983; Mech 1995*b*, 1999; Packard 2003). According to our data, parturition in our northern study areas (Scandinavia and AK, USA) occurs in early to mid-May, whereas pups are born in mid-April in the northern contiguous United States and southern Europe. For analyses regarding pup age, we set pup birth month to April in the southern study areas and May for areas in the north. We also based time intervals to next reproduction on these parturition dates.

Groups dissolved when members died or dispersed from the original territory, leaving territories either vacant or occupied by solitary wolves. We classified territories as reestablished when occupied by new wolves or when remaining solitary wolves found new mates. However, we did not consider territories reestablished when neighboring wolves expanded their territories into vacant areas. Budding occurred when a wolf mated with an outsider and established a territory adjacent to its natal territory (Fritts and Mech 1981, Fuller 1989, Meier et al. 1995, Mech and Boitani 2003). Splitting differed from budding in that a subgroup of wolves permanently split off from the original pack and formed a new territory adjacent to the original (Meier et al. 1995, Mech et al. 1998, Hayes et al. 2000, Mech and Boitani 2003).

Saturated wolf populations were at or near carrying capacity, had relatively low prey biomass-to-wolf ratios, and displayed variable rates of population growth (Mech and Boitani 2003). We defined the Denali population (Meier et al. 1995, Mech et al. 1998), the Kenai population (Peterson et al. 1984, Jozwiak 1997), the northeastern Minnesota population (Mech 1977*a*, *b*), and the Greek population (Migkli et al. 2005, Iliopoulos et al. 2006) as saturated populations. In contrast, recolonizing wolf populations in Scandinavia (Wabakken et al. 2001, Liberg et al. 2008), Wisconsin (Wydeven et al. 1995, Kohn et al. 2000), northwestern Minnesota, USA (Fritts and Mech 1981), and the northern Rocky Mountains (Bangs et al. 1995, 1998, 2004, 2005) had high growth rates and high prey abundance. Recolonizing populations were initially small and isolated to some degree from larger, saturated populations and they were intensively monitored. As such,

Table 1. Cases ($n = 134$) of lost breeding wolves ($n = 148$) by study area and sex in Europe and North America, 1970–2003.

Location	No. breeders lost		No. cases
	F	M	
AK, USA			
Denali National Park	19	14	27
Kenai Peninsula	7	2	9
Rocky Mountains, USA			
Yellowstone National Park	13	11	23
Northwestern MT	7	12	16
ID	4	6	6
Great Lakes, USA			
WI	15	11	26
Northeastern MN	1	1	2
Northwestern MN		3	3
Europe			
Scandinavia (Norway and Sweden)	7	14	21
Greece		1	1

recolonizing populations were ideal for studying the effects of population size on time to reestablishment of breeders and subsequent reproduction in wolf territories.

Statistical Analysis

We analyzed our data with SPSS version 15.0 (SPSS, Chicago, IL) statistical software and assessed normality with the Lilliefors test (Lilliefors 1967). Data were generally nonnormal in nature, and thus we used nonparametric methodology. For cross-tabulations, we used Pearson chi-squares to test for independence between data sets; however, for cases with cell counts ≤ 5, we used likelihood ratios (G) and Fisher's exact test for 2×2 contingent tables. We used Mann–Whitney tests to compare between pairs of independent samples. We used multiple logistic stepwise regressions to determine the most important factors influencing binary parameters for pup survival and included factors for group size at the time of loss (total no. of adult-sized wolves and litter size), pup age, sex of remaining breeders, and presence or absence of breeders or auxiliaries. For correlative analyses, we used the Pearson correlation method. Statistical tests were 2-tailed unless otherwise indicated, and we assessed significance at $\alpha = 0.05$.

RESULTS

We recorded 134 cases involving the loss of 148 breeding wolves (75 M and 73 F; Table 1). Most breeding wolves (56.8%) were killed by humans (Table 2), although natural causes accounted for many losses (31.1%).

Effects on Pup Survival

Pups were present after breeder loss in 84 cases, and >1 pups survived in 58 of 71 cases (84.5%) with known outcomes (Table 3). Pup survival did not differ between cases where breeders of one sex remained and where breeders were absent (Fisher's exact test: $P = 0.60$, $n = 71$). For the combined data, we found no difference in pup survival between sexes of surviving solitary breeders (Fisher's exact test: $P = 0.19$, $n = 61$; Table 3).

Pup age averaged 5.49 months (SD = 2.97, $n = 67$) at the time of breeder loss. In the combined sample, we found similarities in pup survival between 4 3-month age categories ($G = 1.75$, df = 3, $P = 0.62$, $n = 67$). Between 3-month age categories, pup survival did not differ for solitary females ($G = 6.53$, df = 3, $P = 0.09$, $n = 31$), solitary males ($G = 2.72$, df = 3, $P = 0.44$, $n = 26$), or cases where breeding pairs were absent ($G = 2.83$, df = 2, $P = 0.24$, $n = 7$). Within 3-month pup age categories, we found no differences in pup survival between sexes of remaining solitary breeders for pups aged 0–2 months (Fisher's exact test: $P = 1.00$, $n = 11$), 3–5 months (Fisher's exact test: $P = 0.62$, $n = 20$), 6–8 months (Fisher's exact test: $P = 0.38$, $n = 16$), or 9–11 months (Fisher's exact test: $P = 0.13$, $n = 10$; Table 3).

Younger (<6 months) and older (≥6 months) pups survived equally when we considered all cases (Fisher's exact test: $P = 0.54$, $n = 67$). Likewise, pup survival did not differ between younger and older pups where solitary breeders remained (Fisher's exact test: $P = 0.20$, $n = 57$) or where breeding pairs were absent (Fisher's exact test: $P = 1.00$, $n = 7$). Younger and older pups survived equally where solitary males remained (Fisher's exact test: $P = 1.00$, $n = 26$), whereas survival of older pups (100.0%, $n = 16$) differed from survival of younger pups (73.3%, $n = 15$) where solitary female breeders remained (Fisher's exact test: $P = 0.43$, $n = 31$). Sex of solitary breeders did not influence the survival of younger pups (Fisher's exact test: $P = 1.00$, $n = 31$). However, survival of older pups differed between solitary female (100.0%, $n = 16$) versus male breeders (70.0%, $n = 10$; Fisher's exact test: $P = 0.046$; Table 3).

For cases where older (>6 months) pups survived, group sizes did not differ between cases where solitary female ($\bar{x} = 6.50$, SD = 2.56, $n = 16$) and male ($\bar{x} = 6.14$, SD = 4.06, $n = 7$) breeders remained (Mann–Whitney: $U = 42.50$, $Z = -0.92$, $P = 0.36$). However, group sizes for surviving older pups ($\bar{x} = 6.39$, SD = 2.99, $n = 23$) were larger than group sizes where older pups did not survive ($\bar{x} = 3.00$, SD = 1.00, $n = 3$; Mann–Whitney: $U = 5.50$, $Z = -2.36$, 1-tailed $P = 0.01$; Table 3).

Pup survival generally varied with group size at the time breeders were lost ($G = 4.89$, df = 2, $P = 0.006$, $n = 69$). Pup survival was greater in groups of >6 wolves (90.0%, $n = 40$) versus groups with fewer wolves (68.9%, $n = 29$; $G = 18.02$, df = 6, 1-tailed $P = 0.02$). Pup survival also varied with litter size ($G = 20.11$, df = 6, $P = 0.003$, $n = 68$), and it was greater in litters with >1 pup (85.2%, $n = 61$) versus litters with solitary pups (42.9%, $n = 7$; Fisher's exact test: 1-tailed $P = 0.01$, $n = 68$). In addition, pup survival was also lesser in litters with 1 or 2 pups (66.7%, $n = 21$) versus larger litters (87.2%, $n = 47$; Fisher's exact test; 1-tailed $P = 0.04$, $n = 68$; Table 4). Mean litter sizes before breeder loss were larger for litters with surviving pups versus litters where pups did not survive (1-tailed $P = 0.03$). Litter sizes generally declined after breeders were lost ($P < 0.001$; Table 5).

The number of surviving pups correlated with the number of surviving adult-sized wolves in groups (Pearson correla-

Table 2. Causes of lost of breeding wolves ($n = 148$) in Europe and North America, 1970–2003.

Cause of loss	*n*
Anthropogenic mortality	
Capture-related	5
Euthenasia	2
Illegal kill (including probable)	34
Legal kill	9
Lethal control	20
Translocation	5
Vehicle collision	9
Natural mortality	
Accident	8
Disease or malady	10
Intraspecific strife	24
Other	4
Unknown mortality	17
Dispersal	1

tion: $r = 0.41$, $P = 0.001$, $n = 67$). Auxiliary nonbreeders benefited pup survival ($\chi^2 = 7.59$, df = 1, 1-tailed $P = 0.003$), with pups surviving in 91.9% of cases where auxiliaries were present ($n = 37$) and 64.3% of cases where auxiliaries were absent ($n = 28$). The number of adult-sized wolves was greater in groups where pups survived both before (1-tailed $P = 0.002$) and after (1-tailed $P = 0.001$) breeders were lost. In general, group sizes naturally diminished as a consequence of mortality and dispersal after breeder loss (1-tailed $P < 0.001$; Table 5).

The most important factor influencing whether pups survived was the number of adult-sized wolves remaining in the pack at the time breeders were lost (logistic regression: log likelihood ratio test: $G = 20.11$, df = 1, $P < 0.001$, $n = 66$). Addition of the term for pup age (logistic regression: partial log likelihood ratio test, $G = 5.30$, df = 1, $P = 0.02$, $n = 66$) improved the explanatory power of the model.

Effects on Future Reproduction

Wolves reproduced within territories the season after breeder loss in 46.8% of cases ($n = 111$). Breeders were more likely to be replaced within 12 months where breeders of one sex remained (60.7%) than where breeding pairs were absent (27.3%; $\chi^2 = 7.92$, df = 1, 1-tailed $P = 0.002$, $n = 111$). Consequently, the ability of wolves to reproduce the season after breeder loss was greater in cases where one breeder had to be replaced (56.2%) versus cases where both breeders had to be replaced (9.1%; $\chi^2 = 15.71$, df = 1, 1-tailed $P < 0.001$, $n = 111$). Breeders mostly persisted to the birth of pups (96.2%), although 2 males that fathered pups (3.8%) died before litters were born ($n = 52$). The sex of remaining solitary breeders did not influence the ability of wolves to reproduce the season after breeder loss ($\chi^2 = 0.00$, df = 1, $P = 0.98$, $n = 86$; Table 6). Group size after breeder loss was greater for wolves that reproduced the following season ($\bar{x} = 6.46$, SD = 5.24) than for wolves that did not reproduce ($\bar{x} = 3.16$, SD = 2.95; Mann–Whitney: $U = 797.50$, $Z = -3.97$, $n_1 = 52$, $n_2 = 55$, 1-tailed $P < 0.001$).

For the combined data, we found that time interval did not influence the frequency of reproduction the next season ($\chi^2 = 3.34$, df = 3, $P = 0.34$, $n = 111$), which held for cases where solitary males ($G = 0.58$, df = 3, $P = 0.90$, $n = 42$) or female breeders remained ($G = 1.80$, df = 3, $P = 0.61$, $n = 44$). Frequency of reproduction the next season did not differ between sexes of remaining solitary breeders when the time remaining to the reproductive season was 1–3 months (Fisher's exact test: $P = 0.62$, $n = 18$), 4–6 months ($\chi^2 = 0.04$, df = 1, $P = 0.85$, $n = 25$), 7–9 months (Fisher's exact test: $P = 0.65$, $n = 20$), or 10–12 months (Fisher's exact test: $P = 1.00$, $n = 23$). Likewise, frequency of reproduction did

Table 3. Wolf pup fate classified by number and sex of breeders remaining and pup age at time of event in Europe and North America, 1970–2003 ($n = 84$).

Pup age (months)	Breeder(s) remaining	>1 pup survived	No pups survived	Unknown
0–2	F	2	1	1
	M	5	3	2
	Multiple[a]	1	0	0
	None	0	0	0
3–5	F	9	3	0
	M	7	1	0
	Multiple[b]	1	0	0
	None	1	0	1
6–8	F	10	0	0
	M	5	1	0
	Multiple[c]	1	0	0
	None	2	2	2
9–11	F	6	0	1
	M	2	2	3
	Multiple	0	0	0
	None	2	0	2
Unknown	F	3	0	0
	M	1	0	1
	Multiple	0	0	0
	None	0	0	0

[a] F lost; 1 M and 1 F breeder remained.
[b] F lost; 1 M and 2 F breeders remained.
[c] M lost; 2 F breeders remained.

Table 4. Wolf pup fate in relation to group size ($n = 84$) and litter size ($n = 81$) at the time of breeder loss[a] in Europe and North America, 1970–2003.

Variable	>1 pup survived	No pups survived	Unknown
Group size			
2	2	3	3
3	3	3	2
4	11	2	0
5	4	1	3
≥6	36	4	5
Unknown	2	0	0
Litter size			
1	3	4	2
2	11	3	3
≥3	41	6	8

[a] Adjusted for known mortalities at time of breeder loss. Later pup mortality not included.

not differ between cases where one breeder had to be replaced versus situations where both had to be replaced for time intervals of 4–6 months (Fisher's exact test: $P = 0.60$, $n = 30$), 7–9 months (Fisher's exact test: $P = 0.08$, $n = 24$), or 10–12 months (Fisher's exact test: $P = 0.17$, $n = 29$). However, when the next reproductive season was ≤3 months away, frequency of reproduction differed between cases where one breeder had to be replaced (58.3%, $n = 24$) versus cases where both breeders had to be replaced (20.0%, $n = 5$; Fisher's exact test: $P = 0.01$, $n = 28$; Table 6).

We found that mean time to breeder replacement differed between small (≤75 wolves) recolonizing populations (19.1 months) and larger (>75 wolves) populations (9.3 months; Mann–Whitney: $U = 318.00$, $Z = -3.05$, $n_1 = 34$, $n_2 = 33$, $P = 0.002$); similarly, average times to next reproduction differed between small (22.6 months) and larger (12.1 months) recolonizing wolf populations (Mann–Whitney: $U = 258.50$, $Z = -3.26$, $n_1 = 33$, $n_2 = 30$, $P = 0.001$). For saturated versus small recolonizing wolf populations, we also found similar differences in times to breeder replacement (Mann–Whitney: $U = 313.50$, $Z = -2.81$, $n_1 = 34$, $n_2 = 31$, $P = 0.005$) and next reproduction (Mann–Whitney: $U = 333.50$, $Z = -2.05$, $n_1 = 33$, $n_2 = 29$, $P = 0.04$). However, we found no differences between large recolonizing and saturated wolf populations for times to breeder replacement (Mann–Whitney: $U = 504.50$, $Z = -0.10$, $n_1 = 33$, $n_2 = 31$, $P = 0.92$) or next reproduction (Mann–Whitney: $U = 377.00$, $Z = -0.88$, $n_1 = 30$, $n_2 = 29$, $P = 0.38$; Table 7). We found inverse relationships between the size of recolonizing populations and times to breeder replacement (Pearson correlation: $r = -0.37$, $P = 0.002$, $n = 67$) and next reproduction (Pearson correlation: $r = -0.36$, $P = 0.004$, $n = 63$; Fig. 1). Time to breeder replacement correlated strongly with time to next reproduction (Pearson correlation: $r = 0.97$, $P < 0.001$).

Impacts on Groups and Territories

In 47 of 123 cases (38.2%), groups dissolved and abandoned their territories after breeder loss (Table 8). Of dissolved groups, territorial wolves became reestablished in 25 cases (53.2%), and in an additional 10 cases (21.3%) neighboring wolves usurped vacant territories. The proportion of groups dissolving did not differ between sexes of remaining solitary

Table 5. Wolf group sizes and pup survival before[a] and after[b] breeders were lost in Europe and North America, 1970–2003.

		>1 pup survived							
		Group size			(yes vs. no)			Before vs. after breeder loss	
Categories	>1 pup survive?	n	$\bar{x}$	SD	U[c]	Z	(1-tailed)	Z[d]	(1-tailed)
Pups									
Before loss	Yes	55	4.49	3.30	242.50	−1.82	0.034	−3.54	<0.001
	No	13	3.00	2.00				−3.20	<0.001
	Total	68	4.21	3.14				−4.74	<0.001
After loss	Yes	55	3.80	3.04	0.00	−5.65	<0.001		
	No	13	0.00	0.00					
	Total	68	3.07	3.12					
Ad-sized wolves									
Before loss	Yes	56	4.57	3.06	179.00	−2.95	0.002	−6.76	<0.001
	No	13	2.31	0.63				−3.28	<0.001
	Total	68	4.18	2.92				−7.75	<0.001
After loss	Yes	55	3.33	2.85	177.00	−2.90	0.002		
	No	13	1.23	1.01					
	Total	68	2.87	2.69					
All wolves									
Before loss	Yes	56	9.27	5.15	164.00	−3.09	0.001	−6.80	<0.001
	No	13	5.31	2.06				−3.12	<0.001
	Total	69	8.52	4.97				−7.39	<0.001
After loss	Yes	56	7.30	4.77	18.00	−5.34	<0.001		
	No	13	1.23	1.01					
	Total	69	6.16	4.93					

[a] No mortalities included.
[b] Includes all known mortalities after the event.
[c] Mann–Whitney U test.
[d] Wilcoxon signed rank test.

Table 6. Frequency of reproduction within wolf pack territories the season after breeder loss relative to time remaining to next season and number of breeders remaining in Europe and North America, 1970–2003 ($n = 120$[a]).

Months to next season	Remaining breeder(s)	Reproduction next season? Yes	No	Unknown
1–3	F	5	7	1
	M	4	2	2
	Multiple	0	0	0
	None	0	10	0
4–6	F	7	6	0
	M	6	6	0
	Multiple	1	0	0
	None	1	3	0
7–9	F	7	3	1
	M	5	5	2
	Multiple	1	0	0
	None	0	3	0
10–12	F	5	4	3
	M	8	6	0
	Multiple	1	0	0
	None	1	4	0

[a] Excluding 10 cases where neighboring packs usurped territories and 4 cases with missing data.

breeders ($\chi^2 = 2.67$, df = 1, $P = 0.10$, $n = 94$). However, the proportion of dissolving groups differed ($\chi^2 = 30.01$, df = 1, $P < 0.001$) between cases where breeders remained (25.8%, $n = 97$) versus cases where breeders were absent (84.6%, $n = 26$). Group size influenced the frequency of group dissolution ($\chi^2 = 37.77$, df = 5, $P < 0.001$, $n = 115$; Table 8). Group size after breeder loss was smaller where groups dissolved ($\bar{x} = 2.36$, SD = 3.18) versus cases where groups did not dissolve ($\bar{x} = 5.75$, SD = 4.74; Mann–Whitney: $U = 660.00$, $Z = -5.10$, $n_1 = 42$, $n_2 = 73$, 1-tailed $P < 0.001$).

When we excluded cases where neighboring wolves usurped territories after breeder loss, wolves became reestablished in territories after an average time of 2.72 years (SD = 1.88, $n = 25$). After breeders were lost, group size differed between groups that budded or split ($\bar{x} = 9.43$, SD = 5.74, $n = 7$) and groups that did not bud or split ($\bar{x} = 5.36$, SD = 4.50, $n = 66$; Mann–Whitney: $U = 114.500$, $Z = -2.20$, $n_1 = 7$, $n_2 = 66$, $P = 0.03$).

DISCUSSION

We attempted to quantify and test hypothesized effects of the loss of breeding wolves on pup survival, reproduction, and wolf social groups and territories from data collected under a variety of environmental conditions over varying periods in widely spread geographic localities. In addition, the resolution and coverage of data vary from study to study, which also imposed limitations on our analyses and conclusions. In spite of these drawbacks, our results have given us important insight into the responses of territorial wolves to the loss of breeders, which may be useful for managers that must consider wolf removal as a management tool in recolonizing populations.

Pup Survival

Evolutionary advantages associated with wolf social organization (Mech 1970, Mech and Boitani 2003, Packard 2003), fecundity (Mech 1970, Fuller et al. 2003, Packard 2003), juvenile precociousness and hardiness (Mech 1970, 1993; Packard et al. 1992; Packard 2003), and kin selection (Schmidt and Mech 1997, Mech et al. 1999) may explain why pups often survived breeder loss events, even from an early age. In most cases, >1 pup survived loss of breeders, even though litter sizes diminished afterward. Factors relating to the number of adult-sized wolves, along with pup age, seemed to influence the ability of pups to survive breeder loss events. Differences in pup survival between sexes of remaining breeders seemed to be related to differences in group size.

We found that the number of adult-sized wolves (including remaining breeders) and the presence of auxiliary nonbreeders positively influenced pup survival. Auxiliaries, or helpers, provide food and care for pups through kin-directed altruism (Harrington et al. 1983, Mech 1995*b*, Mech et al. 1999, Packard 2003). The positive influence of auxiliaries was illustrated in the Yellowstone Delta Pack where 7 pups were reared by 6 adult and yearling wolves after the mother died a few weeks after pups were born (Smith et al. 2001). Ballard and Stephenson (1982) found that pup survival was lower in packs with only one adult compared with packs with ≥2 adults. Helpers have been shown to increase offspring survivorship in other group-living species, including black-backed jackals (*Canis mesomelas*; Moehlman 1979), mongoose (*Mungo mungo*; Hedge 2005), and meerkats (*Suricatta suricatta*; Clutton-Brock et al. 2001).

Pup age was only a minor component in explaining why pups survived breeder loss. Juveniles are able to scavenge and hunt smaller prey and survive harsh weather conditions (Messier 1985, Mech 1993). Juveniles develop rapidly and they are sufficiently mobile to join packs on hunts by the age

Table 7. Time intervals (months) to breeder replacement ($n = 98$) and to next reproduction ($n = 92$) in pack territories by population type and size in Europe and North America, 1970–2003.

Population type	Breeder replacement n	$\bar{x}$	SD	Next reproduction n	$\bar{x}$	SD
Recolonizing (≤75 wolves)	34	19.09	19.50	33	22.58	19.47
Recolonizing (>75 wolves)	33	9.27	12.11	30	12.08	11.70
Recolonizing (total)	67	14.25	16.90	63	17.57	16.97
Saturated	31	10.42	14.95	29	15.31	15.58
Total	98	13.04	16.33	92	16.86	16.49

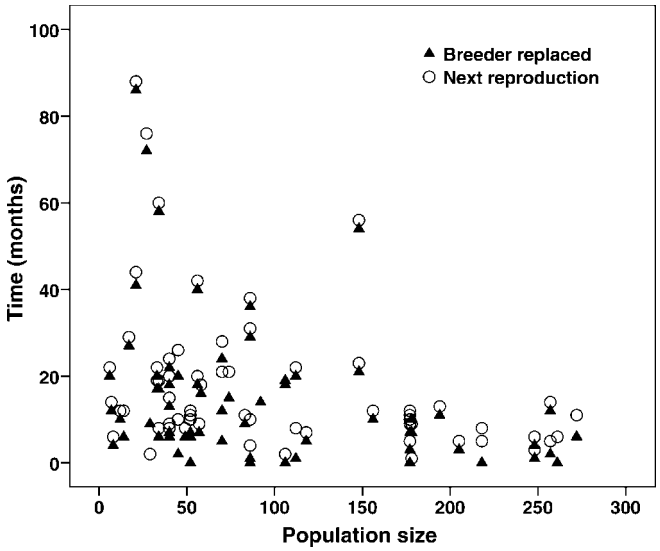

Figure 1. Relationship between size of recolonizing wolf populations and time intervals to breeder replacement ($n = 67$) and next reproduction ($n = 63$) in Europe and North America, 1970–2003.

of 4 months (Packard 2003). Our data include instances where solitary parents (2 F and 1 M) successfully raised pups from an early age without the assistance of other wolves (Boyd and Jimenez 1994). The youngest pups included in our study that survived the loss of both parents were 5 months old; pups aged ≥5 months survived the loss of both parents in 71% of cases ($n = 7$). Elsewhere, pups have been shown to survive without parents from the age of 4 months (Fritts et al. 1984, 1985; Packard 2003).

Food availability has been shown to positively influence pup survival (Fuller et al. 2003), and Harrington et al. (1983) suggested that it was more important than the presence of auxiliaries in packs. However, the ability of packs to kill prey also should influence the ability of pups to survive, and our results indicated that the number of adult-sized wolves in packs benefited pup survival. Sand et al. (2006) suggested that the ability of wolf packs to effectively kill prey may be dependent upon the presence of the breeding pair, because pups do not contribute substantially to the outcome of hunts (Mech 1966, Haber 1977, Mech and Peterson 2003). Similarly, Funston et al. (2001) demonstrated that large groups of adult female lions (*Panthera leo*) were more successful than smaller female groups with subadults large cubs, or both in killing medium-sized prey. In addition, small groups may have to compete to a large extent with scavengers (Peterson and Ciucci 2003, Vucetich et al. 2004), which may, in turn, have adverse effects on survival of pups.

Reproduction

We found that wolves only reproduced in 47% of cases in the season after breeder loss. In contrast, wolf pairs normally produce pups every year in thriving populations (Fritts and Mech 1981, Mech and Hertel 1983, Peterson et al. 1984, Mech and Boitani 2003). The loss of one breeder was more easily mitigated than the loss of both, in terms of breeder replacement and subsequently the ability of wolves to reproduce the next summer.

The time interval for replacement of breeders and next reproduction was much longer for small recolonizing populations compared with either larger recolonizing or saturated wolf populations. The shorter time interval in larger recolonizing and saturated populations may be due to the supply of dispersing wolves or nonterritorial floaters, which is presumably higher in larger populations and is probably a key factor influencing replacement of breeding wolves (Fuller et al. 2003). Breeders are usually replaced by unrelated adults (Peterson et al. 1984, Messier 1985, Stahler et al. 2002); in some instances, pack members can usurp breeder positions (Mech and Hertel 1983, Mech 1995*b*). Although wolves generally avoid incestuous mating, it can occur (Peterson et al. 1984, Mech 1995*b*, Smith et al. 1997, Mech and Boitani 2003). In Scandinavia, incestuous breeding occurred when packs were isolated and the

Table 8. Group and territory cohesion relative to the number and sex of remaining breeders and postloss group size in Europe and North America, 1970–2003 ($n = 123$[a]).

	Group dissolved			Group remained		
Variable	Territory abandoned[b]	New group formed	Territory usurped[c]	Territory intact	Territory split	Territory shifted
Surviving breeder						
F	3	4	2	32	5	1
M	2	10	4	30	1	0
Multiple	0	0	0	2	1	0
None	7	11	4	4	0	0
Postloss group size						
0	4	6	4	0	0	0
1	3	6	3	8	0	1
2	0	2	0	9	0	0
3	1	1	1	8	1	0
4	1	2	0	11	1	0
≥5	3	4	1	29	5	0
Unknown	0	4	1	3	0	0

[a] We excluded 2 cases involving packs taken into captivity.
[b] Includes 3 cases where all wolves were removed.
[c] Through territory expansion by neighboring wolves.

population was very small (Wabakken et al. 2001, Vilà et al. 2002, Liberg et al. 2005).

We have seen that population size influences replacement of breeders and subsequent reproduction in territories. It is probable that proximity of other wolf territories, along with the number of solitary, dispersing wolves, will influence the frequency with which lost breeders will be replaced. Fuller et al. (2003) indicated that isolated packs generally had a lower chance of persisting than those near other packs. In Alaska, USA, and in Canada, local wolf populations that had nearly been eliminated through intensive control measures rebounded within 2–4 years through the immigration of breeding wolves from surrounding areas (Gasaway et al. 1983; Ballard et al. 1987; Potvin et al. 1992*a*, *b*; Hayes and Harestad 2000). In contrast, the Scandinavian wolf population was relatively isolated from the larger source population in Finland and Russia (Wabakken et al. 2001, Vilà et al. 2002, Flagstad et al. 2003, Liberg et al. 2005, Linnell et al. 2005), and during the early phase of recovery dispersers sometimes settled long distances from established territories through leaping presaturation dispersal (Wabakken et al. 2001). Wolves displayed similar dispersal patterns in recolonizing populations in Montana (Boyd et al. 1995) and Wisconsin (Wydeven et al. 1995). In such situations, it may take years for solitary adults to find new mates.

Groups and Territories

Removing breeders may disrupt packs and scatter remaining wolves or subdivide existing wolf territories with the effect of increasing wolf densities locally (Ballard and Stephenson 1982). In our study, wolves remained in territories after breeders were lost in 62% of cases. Of those territories that dissolved, wolves later became reestablished in 74% of cases, either through recolonization or invasion by neighboring territorial wolves. We found that budding or splitting occurred in larger packs, which was similar to results reported previously (Hayes et al. 2000, Mech and Boitani 2003). Mech and Boitani (2003) speculated that packs split when 2 related breeding pairs are present in the same pack. Splitting of related wolves into new territories ensures a division of resources such that competition between kin is avoided (Mech 1970, Mech and Boitani 2003).

MANAGEMENT IMPLICATIONS

At some point, managers of recolonizing wolf populations may need to remove wolves to reduce conflicts with local human populations. We recommend that managers carefully evaluate the possible impacts of lethal control on territorial wolves relative to ethical and biological considerations. From a strictly humanitarian viewpoint, managers should prioritize removal of solitary wolves or territorial pairs because it can be difficult to selectively remove nonbreeders from packs. However, where management goals dictate that packs with pups must coexist in proximity to humans and their activities, conflicts may be reduced by allowing removal of some pack members. Because there is a risk that breeders can be removed in such scenarios, managers should attempt to minimize pup mortality, social disruption, and breeding interruption when managing reproductive packs. Therefore, we recommend that managers only remove wolves from reproductive packs when pups are >6 months old and packs contain ≥6 members (including ≥3 adult-sized wolves). Ideally, such packs should be close to neighboring packs and occur within larger (≥75 wolves) recolonizing populations.

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