

# Implementing the IUCN RHINO approach at Dombasle-sur-Meurthe's soda ash plant, France



## About the IUCN RHINO approach

The IUCN RHINO approach is an implementation-ready framework for companies, governments, and civil society to deliver Rapid, High-Integrity Nature-positive Outcomes (RHINO). It guides organisations on what to do, where to act, and how to measure progress, contributing to the Kunming-Montreal Global Biodiversity Framework and the UN Sustainable Development Goals. Organisations can apply it through three tracks – Direct Impact, Value Chain Impact, and Investor Impact – depending on their interface with nature.

IUCN RHINO's core metric, aligned with the Taskforce on Nature-related Financial Disclosures (TNFD) and Nature Positive Initiative guidelines, is the Species Threat Abatement and Restoration metric (STAR), derived from the IUCN Red List of Threatened Species™.

STAR quantifies how conservation actions could reduce global species extinction risk through two components: threat abatement (STAR<sub>T</sub>) and restoration (STAR<sub>R</sub>), both spatially explicit and aggregable across sites, portfolios, and jurisdictions, to support consistent planning and monitoring. IUCN RHINO pilots currently focus on STAR<sub>T</sub>, as reducing threats where biodiversity persists is the most effective way to prevent further loss.

STAR<sub>T</sub> is calculated for threatened and Near Threatened species, weighting each species' Area of Habitat in the assessed area by its extinction risk category, so more at-risk species, and species whose habitat highly depends on the assessed area, count for more. The score is broken down by threat, showing which pressures drive extinction risk so interventions can be prioritised where they matter most.



## Background, objectives and implementation of the pilot

Solvay's soda ash business is built on a process to produce sodium carbonate from mineral raw materials, requiring extractive activities. The company manages land holdings and raw material quarries globally to supply limestone and salt for its soda ash operations since 1873, some located near biodiversity-sensitive areas. These landholdings present an opportunity for biodiversity restoration.

Solvay has disclosed a 30x30 commitment to dedicate 30% of its sites' permeable land located near biodiversity-sensitive areas to nature conservation and restoration, in alignment with the Kunming-Montreal Global Biodiversity Framework.

To reach this objective, Solvay is committed to implement site biodiversity action plans (BAP) on 16 priority manufacturing sites by 2030. The three-year collaboration with IUCN launched in 2025 aims to help Solvay achieve their commitment and reinforce their biodiversity roadmap using IUCN's tools.

In this context, Solvay was interested in piloting the IUCN RHINO approach to explore how a science-based metric like STAR could further inform and strengthen its priority site BAPs. Dombasle-sur-Meurthe in France, Solvay's most advanced site in BAP development, was selected in April 2025 for an independent site review and IUCN RHINO pilot, to assess the company's approach to biodiversity and explore options for enhancing biodiversity value on site.

The pilot began with this review in 2025 and was revised in 2026 to include new data. It involved Solvay global biodiversity team and Dombasle site teams, with contributions from local biodiversity experts and non-governmental organisations (NGO) who regularly assist Solvay with ecological inventories, and technical support from IUCN Business and Nature team.

## Implementing IUCN RHINO's Direct Impact Track

### A1. Locate

The Locate phase aims to provide a thorough understanding of an organisation's interface with areas important for biodiversity, to help identify priority sites and areas for conservation. In the context of this pilot, the Locate phase focused on gathering local information related to Dombasle soda ash plant site.

### Screen and prioritise for the pilot

To identify its 16 priority sites, Solvay ranked its production sites and associated mines and quarries using a scoring methodology combining biodiversity data from the [Integrated Biodiversity Assessment Tool \(IBAT\)](#), ten environmental risk indicators from WWF's Biodiversity Risk Filter, and site surface area as a theoretical proxy for operational footprint. Weighting and normalising these three dimensions produced a biodiversity prioritisation score for each site.

Dombasle was selected as Solvay's first IUCN RHINO pilot site for its strong site organisation and the availability of resources and data to support implementation.

### Gather pilot location information and data

Solvay's Dombasle plant has produced soda ash on the Meurthe River since 1873, making it one of the Group's oldest continuously operating sites. The site sits within the "Pays du Sel et du Vermois" area of Meurthe-et-Moselle, a region historically defined by salt extraction.

Sodium carbonate manufacturing depends on salt extracted from boreholes near the plant and limestone sourced from the Saint-Germain-sur-Meuse quarry located 45 km away and transported by rail to Dombasle.



The site is organised into four operational areas presented in Figure 1: the plant itself, the boreholes area for brine extraction, the quarry owned and operated by Solvay, and an ecological corridor along the Meurthe's banks comprising several dykes and cooling basins that help regulate material and thermal emissions in compliance with environmental regulations.



**Figure 1:** Dombasle-sur-Meurthe site and its four areas  
(Source: IUCN based on Solvay's data)

The plant sits in the Meurthe's alluvial valley, whose humid conditions support wet meadows, tall-herb communities (megaphorbia) and alluvial woodlands – habitats of high heritage value, some classified as being of “Community interest” under EU habitat classification. Protected areas are confirmed around the quarry: Natura 2000 (Birds Directive) and Natural Areas of Ecological, Faunistic, and Floristic Interest (*Zone naturelle d'intérêt écologique, faunistique et floristique* - ZNIEFF) Type I zones border Saint-Germain-sur-Meuse.

Salt-basin exploitation in the area was industrialised in the 19th century. The current ecological condition of the Meurthe River reflects the cumulative influence of multiple development, including a combination of industrial presence and river modification, resulting in altered habitats and ecological fragmentation across the territory.



## Map stakeholders at the landscape level

Solvay's long-standing presence has shaped the surrounding territory's economic and social network, sustained through employment and relationships with local authorities, residents, schools and associations. The area's underground salt reserves have also attracted other salt and soda ash producers alongside Solvay, whose operations collectively contribute to pressures on local rivers.

Much of the surrounding land is farmed by tenants on property currently owned by Solvay, presenting an opportunity to extend biodiversity-friendly practices. The stakeholder landscape further includes conservation organisations such as the League for the Protection of Birds (*Ligue pour la Protection des Oiseaux – LPO*), a Birdlife member, alongside local communities and government entities.

At the species level, the European Turtle-dove (*Streptopelia turtur*), whose presence is confirmed in the area, is the subject of a 2021 national management plan (*Plan National de Gestion - PNG*) aimed at habitat restoration, developed following EU infringement proceedings over the species' declining conservation status.

## Define the Area of Influence of Solvay Dombasle site

In the IUCN RHINO approach, the 'Area of Influence' refers to the geographic area where a site's activities, including associated facilities, could potentially impact biodiversity and ecosystem services through direct, indirect and cumulative effects. The Area defines the geographical scope within which meaningful actions to deliver IUCN RHINO outcomes should be developed and managed.

For Dombasle, the project team identified two Areas of Influence, assessed separately given their distinct geographical and ecological contexts: one for the soda ash plant and one for the limestone quarry. As shown in Figure 2, the plant's Area of Influence appears on the right and the quarry's on the left.

The first, covering 261 km<sup>2</sup>, spans the Dombasle plant and its surrounding landscape, including natural habitat blocks around the facilities, the Meurthe River to the south and the boreholes to the north. Its perimeter was delineated to capture, at a regional level, populations of globally threatened species potentially affected by existing threats and by future actions identified through STAR<sub>T</sub> results, using natural boundaries and limits of urbanisation. The perimeter avoids the land holdings of competing companies but includes surrounding agricultural areas outside Solvay's properties, given their relevance to the threats and opportunities affecting the target species.

A second Area of Influence (118 km<sup>2</sup>) was defined around the limestone quarry located in Saint-Germain, approximately 45 km from the Dombasle plant.





**Figure 2:** Areas considered for the analysis delineated by Solvay and IUCN. In blue the area around the Dombasle soda ash plant (261 km<sup>2</sup>). In yellow, the area around the quarry (118km<sup>2</sup>). (Source: IUCN based on Solvay's data)

## Compile preliminary threatened species and threat data

An *IBAT Species Report (estimated STAR)* was generated for both Areas of Influence. It provisionally identifies the drivers causing impacts on the globally threatened species present in the area and their relative importance, based on estimated STAR<sub>T</sub> scores. This report identified a list of 11 species for the AOI of the soda ash plant, and 10 species for the quarry. Their respective STAR<sub>T</sub> scores reach 26.5 centi-STAR and 12.8 centi-STAR.

Although the plant's Area of Influence is more than twice the size of the quarry's, both areas carry a comparable concentration of species extinction risk. The quarry supports a proportionally higher density of threatened species relative to its smaller footprint.

Results from this step could be used by Solvay to inform the TNFD Locate-Evaluate-Assess-Prepare (LEAP) L4 component 'Interface with sensitive locations'.



## A2. Evaluate

During this phase of the IUCN RHINO approach, the project team confirmed and revised species occurrence and potential threat presence on the ground within the Areas of Influence. A calibrated STAR<sub>T</sub> score was calculated to serve as a baseline for the species extinction risk and provide a more detailed evaluation of nature-related dependencies and impacts.

### Confirm species

The species listed in the *IBAT Species report (estimated STAR)* were compared with those present in Solvay's surveys. Solvay used existing data from biological inventories on mammals, birds, reptiles and amphibians previously collected by the site (e.g. through fauna trapping, camera surveys, on field visits), and reviewed with local biodiversity consultants.

As a result, 7 of the 11 species identified in the IBAT report were confirmed present in the soda ash plant area and included in the calculation of calibrated STAR<sub>T</sub>: five species with Vulnerable (VU) status, two mammals (Garden Dormouse (*Eliomys quercinus*), Western European Hedgehog (*Erinaceus europaeus*)) and three birds (Aquatic Warbler (*Acrocephalus paludicola*), Common Pochard (*Aythya ferina*) and European Turtle-dove (*Streptopelia turtur*)); and two birds with Near Threatened (NT) status.

For the quarry area, 4 of 10 species were confirmed present and included in the calculation: Garden Dormouse (VU), Western European Hedgehog (VU), European Turtle-dove (VU), and one bird with NT status. All species confirmed at the quarry area are also present at the plant area, and no additional threatened species beyond those in the estimated STAR list were identified.

For these species, IUCN provided the species' Areas of Habitat (AoH) from the IUCN Red List of Threatened Species™ database.

### Confirm threats

The Solvay team revised the threats that were listed in the IBAT Species report (estimated STAR) for each species present in the area. The team referred to the [IUCN Threats Classification Scheme](#), with Level 2 used to define threats for STAR scores.

The calibration of the threat was performed through a first screening using generative artificial intelligence to identify the scope and severity of identified potential threats from reliable sources of secondary data. This analysis drew from multiple public sources available in France and Europe including the French national Red List (*Comité Français de l'IUCN, Muséum National d'Histoire Naturelle*); BirdLife database; the Regional Directorate for the Environment, Development and Housing (*Direction Régionale de l'Environnement, de l'Aménagement et du Logement, DREAL Grand Est*) for industrial pressures; the Rhin-Meuse Water Agency (*Agence de l'Eau*) for water quality and agricultural effluents; datasets such as EU's CORINE Land Cover and the Graphical Parcel Register (*Registre Parcellaire Graphique, RPG*), dedicated to French agriculture; National or European species action plans; and LPO regional reports (*Ligue pour Protection des Oiseaux rapport Grand Est*). Outputs were then reviewed and adjusted by Solvay teams, based on their knowledge of the site.

Each potential threat was quantified as a percentage of population decline (based on Mair et al. 2021)<sup>1</sup>, as shown in Figure 3. This work, the most labour-intensive part of the calibration, is critical as it provides important insights to identify priorities for action.

|       |                   | Severity            |                |                            |                     |            |                                   |
|-------|-------------------|---------------------|----------------|----------------------------|---------------------|------------|-----------------------------------|
|       |                   | Very rapid declines | Rapid declines | Slow, significant declines | Negligible declines | No decline | Causing/ could cause fluctuations |
| Scope | Whole (>90%)      | 63                  | 24             | 10                         | 1                   | 0          | 10                                |
|       | Majority (50-90%) | 52                  | 18             | 9                          | 0                   | 0          | 9                                 |
|       | Minority (<50%)   | 24                  | 7              | 5                          | 0                   | 0          | 5                                 |

**Figure 3:** Translating population decline into numeric percentage (based on Mair et al. 2021)

<sup>1</sup> Mair L. et. al (2021) A metric for spatially explicit contributions to science-based species targets, *Nature Ecology and Evolution* (Vol 5, pp 836-844)



## Calculate first version of baseline

For the Dombasle plant, the final calibrated STAR<sub>T</sub> score amounts to 18.5 centi-STAR, representing 70% of the estimated STAR<sub>T</sub> score. For the Saint-Germain quarry, the final calibrated score reaches 5.4 centi-STAR, representing 40% of the estimated STAR<sub>T</sub> score.

The lower calibrated scores mainly reflect fewer confirmed species on the ground (7 of 11 at the plant, 4 of 10 at the quarry) rather than milder local threats.

Figures 4 and 5 show the calibrated STAR<sub>T</sub> scores by species for the Dombasle soda ash plant and the quarry, respectively.

| Common Name                      | Scientific Name                | Taxa     | IUCN Red List status | Global AOH (x10 <sup>3</sup> .km <sup>2</sup> ) | ‰ AOH within area | STAR <sub>T</sub> score (centi-STAR) | % STAR <sub>T</sub> score |
|----------------------------------|--------------------------------|----------|----------------------|-------------------------------------------------|-------------------|--------------------------------------|---------------------------|
| <b>Aquatic Warbler</b>           | <i>Acrocephalus paludicola</i> | AVES     | VU                   | 1,305                                           | 0.13‰             | 8.7                                  | <b>47.1%</b>              |
| <b>Garden Dormouse</b>           | <i>Eliomys quercinus</i>       | MAMMALIA | VU                   | 519                                             | 0.19‰             | 4.9                                  | <b>26.4%</b>              |
| <b>Western European Hedgehog</b> | <i>Erinaceus europaeus</i>     | MAMMALIA | VU                   | 3,331                                           | 0.08‰             | 3.1                                  | <b>16.9%</b>              |
| <b>Common Pochard</b>            | <i>Aythya ferina</i>           | AVES     | VU                   | 7,156                                           | 0.02‰             | 0.8                                  | <b>4.2%</b>               |
| <b>European Turtle-dove</b>      | <i>Streptopelia turtur</i>     | AVES     | VU                   | 12,727                                          | 0.02‰             | 0.6                                  | <b>3.2%</b>               |
| <b>Woodchat Shrike</b>           | <i>Lanius senator</i>          | AVES     | NT                   | 17,318                                          | 0.02‰             | 0.2                                  | <b>1.2%</b>               |
| <b>Northern Lapwing</b>          | <i>Vanellus vanellus</i>       | AVES     | NT                   | 13,412                                          | 0.01‰             | 0.2                                  | <b>1.0%</b>               |

**Figure 4:** Calibration results by species for Dombasle soda ash plant. AOH stands for Area of Habitat.

| Common Name                      | Scientific Name            | Taxa     | IUCN Red List status | Global AOH (x10 <sup>3</sup> .km <sup>2</sup> ) | ‰ AOH within area | STAR <sub>T</sub> score (centi-STAR) | % STAR <sub>T</sub> score |
|----------------------------------|----------------------------|----------|----------------------|-------------------------------------------------|-------------------|--------------------------------------|---------------------------|
| <b>Garden Dormouse</b>           | <i>Eliomys quercinus</i>   | MAMMALIA | VU                   | 519                                             | 0.143‰            | 3.4                                  | <b>62.7%</b>              |
| <b>Western European Hedgehog</b> | <i>Erinaceus europaeus</i> | MAMMALIA | VU                   | 3,331                                           | 0.041‰            | 1.6                                  | <b>29.8%</b>              |
| <b>European Turtle-dove</b>      | <i>Streptopelia turtur</i> | AVES     | VU                   | 12,727                                          | 0.010‰            | 0.3                                  | <b>6.4%</b>               |
| <b>Northern Lapwing</b>          | <i>Vanellus vanellus</i>   | AVES     | NT                   | 13,412                                          | 0.005‰            | 0.1                                  | <b>1.1%</b>               |

**Figure 5:** Calibration results by species for the Quarry. AOH stands for Area of Habitat.

In this pilot, calculations were performed manually. However, the new IBAT module supporting the calibration process, now available, does not require any manual calculation and produces an *IBAT Species Report (calibrated STAR)*. Results of this phase meet the requirements for species of the TNFD E3 phase related to measuring changes to the state of nature and E4 which recommends assessing the severity of impact for materiality assessment.



## A3. Assess

Through this phase of RHINO, a company will use the threat analysis performed in the Evaluate phase to identify the threats that are most important to mitigate and consult with stakeholders to refine the analysis.

## Assess most important threats

The two Areas of Influence present distinct biodiversity and threat profiles.

In the Dombasle plant area, the top three threats contributing the most to the calibrated STAR<sub>T</sub> score are agriculture and forestry effluents (19.9%), habitat shifting and alteration (18.2%) and annual and perennial non-timber crops (11.8%). Agricultural effluents were assessed as more impactful than land-use changes from non-timber crops, because surface areas under agriculture are comparatively stable over time, unlike effluents. The high contribution of habitat shifting and alteration reflects, in particular, the growing drought and water scarcity experienced in the region, which has affected several of the calibrated species. The complete analysis is shown in Figure 6.

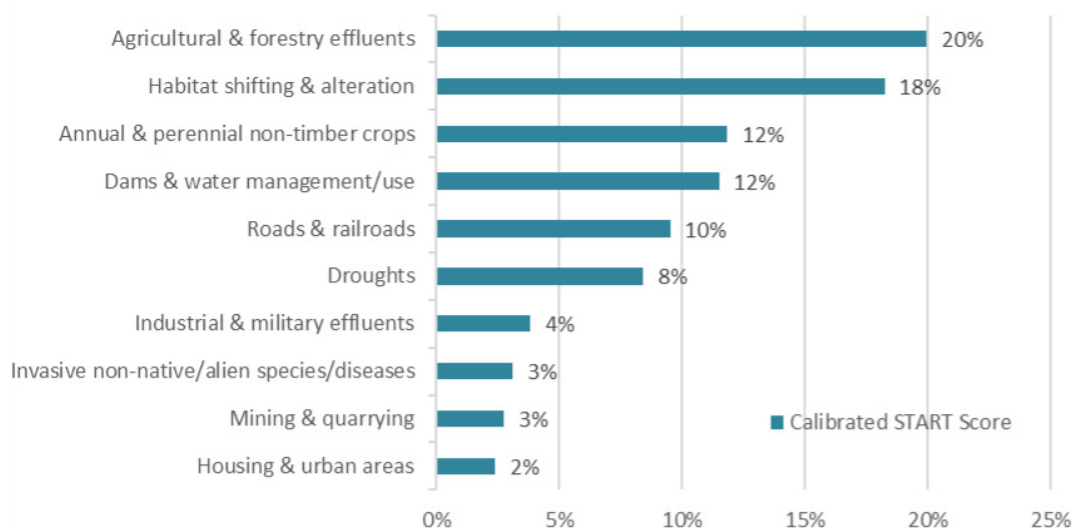


**Figure 6:** Ranking of the main drivers of the species loss in the soda ash plant area (calibrated STAR<sub>T</sub>)

The Dombasle plant area is characterised by numerous aquatic habitats that support the presence of the Aquatic Warbler (*Acrocephalus paludicola*), whose wetland dependency makes it particularly exposed to the area's leading threats – agricultural and forestry effluents and habitat shifting and alteration.

Three species account for more than 90% of the calibrated STAR<sub>T</sub> score in the Dombasle plant area: Aquatic Warbler accounts for 47%, Garden Dormouse (*Eliomys quercinus*) for 26%, and Western European Hedgehog (*Erinaceus europaeus*) for 17%. These species should be considered priorities for threat abatement and conservation action.



In the quarry area, the top three threats contributing the most to the calibrated STAR<sub>T</sub> are roads and railroads (17.8%), agricultural and forestry effluents (17.6%) and annual and perennial non-timber crops (16.9%). The complete analysis is shown in Figure 7.

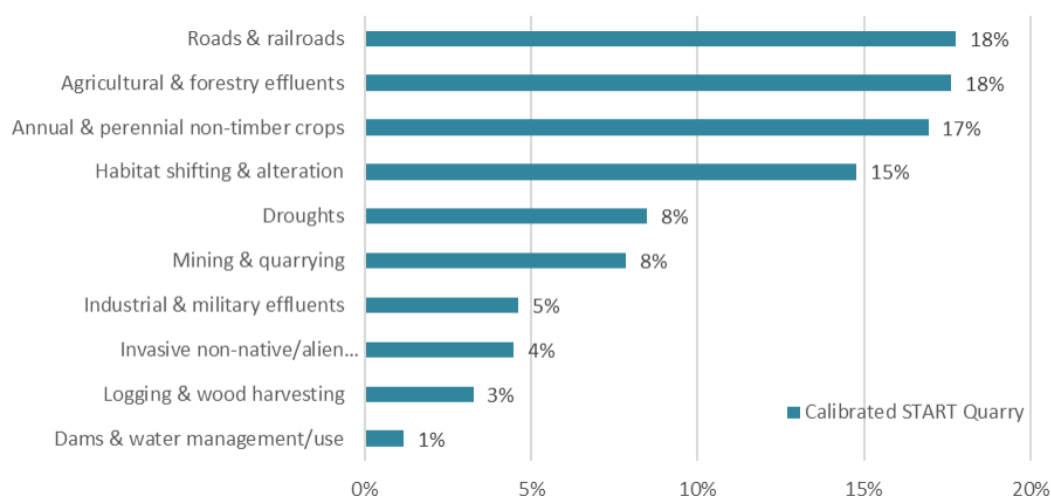


**Figure 7:** Ranking of the main drivers of the species loss in Quarry area (calibrated STAR<sub>T</sub>)

At the quarry, the score is largely concentrated on two species: Garden Dormouse accounts for 63% and Western European Hedgehog for 30%. These two species should therefore be considered as priorities for threat abatement and conservation action.

These rankings reflect the threat profile of the species confirmed and calibrated at Dombasle rather than the site's biodiversity as a whole; a broader assessment covering all species present could surface a different balance of pressures, including a greater contribution from industrial operations.

In the Dombasle plant area, Solvay had already begun implementing several biodiversity actions and developing a biodiversity action plan. An ecological corridor has been delineated along the Meurthe River, where reformed boreholes provide natural refuges to species and habitats that are preserved from some of the threats identified during the STAR assessment. Although these measures were not initially designed for the threatened species identified through the STAR analysis, they could have positive impacts on them.

The calibrated STAR<sub>T</sub> assessment therefore provides species insights that can further inform and strengthen Solvay's approach to biodiversity action and contribute to refining its biodiversity roadmap.

## Socialise results

The IUCN RHINO approach recommends socialising the results of the STAR<sub>T</sub> calibration to discuss the findings and build a common understanding of the key threats that should be addressed as a priority to reduce species extinction risk. In a highly anthropized area such as Dombasle, where multiple pressures occur, such discussion may be particularly insightful, as stakeholders and experts may have different views on pressures and who is driving them. Workshops with stakeholders also provide an opportunity to ensure alignment with national and local biodiversity priorities and to identify potential partners for implementing targeted actions.

As a major landholder with strong relationships across the region's stakeholders, Solvay has real potential to influence landscape-level outcomes.



Much of its land is leased to tenants whose activities may affect species extinction risk, giving Solvay a direct channel to engage these actors and encourage more coordinated biodiversity management. This represents an opportunity to generate positive biodiversity outcomes not only within Solvay's own operational boundaries, but across the wider landscape.

## Recalculate baseline in response to new data and insights

Engaging with stakeholders is likely to result in adjustments in the calculation of calibrated STAR<sub>T</sub> to include the perspectives of other stakeholders: this could lead to recalculating the baseline in response to new data and insights, which is the last step of the Assess phase. This baseline can be used to inform, for the species-related elements, the TNFD LEAP A3 'Risk and opportunity measurement and prioritisation' and A4 'Risk and opportunity materiality assessment'.

## A4. Prepare

During the Prepare phase of the IUCN RHINO approach, the objective is to understand how to respond to the material impacts on nature and risks to the organisation identified in the Assess phase. The outcome will be the formulation of an action plan to address the most important threats, thereby delivering the greatest contribution to Nature Positive outcomes. The action plan can be translated into a science-based target for the reduction of the threats that cause species extinction risk. Such an action plan completed with STAR<sub>T</sub> targets and actions to reduce threats could feed into the biodiversity action plan the Dombasle site is developing.

This may involve developing actions with clearly defined objectives, supported by Solvay, their tenants, local government and other key stakeholders - subject to their interest in participation - to jointly identify and implement actions that balance land use with measurable biodiversity outcomes.

Contributed by: Aurélie Brunel, Rachelle Parasote, Martine Gaudalet, Dorine Tea, Florent Bansept (Solvay), Mathieu Carrara, Florence Curet, Olivier Schär (IUCN).

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Please get in touch to learn more  
[www.iucnrhino.org](http://www.iucnrhino.org)  
[rhino@iucn.org](mailto:rhino@iucn.org)

