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A framework for assessing pressures and threats reported under article 17 of the Habitats directive (92/43/EEC) in Sweden

DG Environment (2022a) describes the reporting format referred to in Article 17 of Directive 92/43/EEC (Habitats Directive). The assessment of pressures and threats on Annex I habitat types and Annex II, IV, and V species is outlined in the 'Explanatory Notes in Support of the Reporting Format Referred to in Article 17 of Directive 92/43/EEC (Habitats Directive)'(DG Environment 2022b), and the 'Guidelines on concepts and definitions' (DG Environment 2023). However, DG Environment (2022b, 2023) does not specify clear criteria for this assessment. This report by the SLU Swedish Species Information Centre (SSIC) aims to address this gap by providing its own interpretations and criteria for assessing pressures on species and habitat types, respectively.

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General principles

According to DG Environment (2023), pressures referred to in the Article-17 reporting should reveal the main drivers behind conservation status deterioration as well as their impact, and help to identify restoration actions. Moreover, they are instrumental for the communication with stakeholders.

This report focuses on the three variables characterizing main pressures and threats: ‘timing’, ‘scope’, and ‘influence’. The report outlines how each variable is assessed based on specific criteria. According to DG Environment (2022b), ‘scope’ and ‘influence’ are assessed only for pressures assessed as ‘ongoing’ or ‘ongoing and likely to be in the future’ in terms of ‘timing’. SSIC makes the following interpretations:

1. ‘Timing’, ‘scope’ and ‘influence’ are assessed independently from one another.
2. Both ‘scope’ and ‘influence’ should be assessed based on how the pressure affects the focal species or habitat type at biogeographical regional scale.
3. For species, the assessment of pressures considers two parameters: i) population size and ii) occupied habitat area and quality. For habitat types, the assessment includes: i) area and ii) habitat condition.
4. The assessment of pressures is independent from the assessment of the parameters range, area, and population size, as well as reference values.

Assessment of pressures and threats

Swedish interpretations according to SSIC are highlighted to the right of DG Environment's (2022b) explanatory notes.

Timing

According to DG Environment (2022b), 'timing' indicates the 'time frame the pressure is acting in'.

DG Environment's (2022b) explanatory notes: Timing		**SSIC's interpretations:**
in the past but now suspended due to measures	For reporting pressures which have become suspended at some point in the current reporting period. Where selected, there is no need to complete the fields on scope and influence.	This category includes only pressures whose adverse effects were suspended between 2019 and 2024 due to implemented measures. Those suspended before 2019 or by other means are not included.
ongoing	For reporting pressures that are ongoing during the reporting period i.e. no evidence of being suspended due to measures.	'Ongoing' implies that the pressure was active 2019-2024. To list a pressure in this category, there must be information indicating both its 'scope' and 'influence' during this period.
ongoing and likely to be in the future	For reporting pressures and threats. Where selected, there is no need to complete the fields on scope and influence for the part of the entry concerning the threat but only for the part that concerns the pressure.	See interpretation of 'ongoing' above. Generally, factors active as 'ongoing' pressures 2019-2024 are likely to remain active as threats 2025-2036 as well.
only in future	For reporting threats. Where selected, there is no need to complete the fields on scope and influence.	There is information suggesting a future impact that warrants consideration in conservation and management measures.

Scope

SSIC defines ‘scope’ as the proportion of a species’ population or a habitat type’s area exposed to the pressure between 2019 and 2024. It is important to note that ‘scope’ refers to exposure, not the actual proportion impacted by the pressure, which is assessed under the third variable, ‘influence’.

DG Environment’s (2022b) explanatory notes: *Scope (proportion of population affected) (or proportion of area affected) [*to be completed for ‘ongoing’ and ‘ongoing and likely to be in the future’ timings only. Although the latter also includes threats, the ‘scope’ and ‘influence’ will only address pressures]		**SSIC’s interpretations:**
whole (>90%)	more than 90% of the population (or the area) reported in the Member State’s biogeographical region is affected by the pressure	This category encompasses wide-ranging pressures that essentially the entire population or area were exposed to during 2019-2024.
majority 50 – 90%	between 50 – 90% of the population (or the area) reported in the Member State’s biogeographical region is affected by the pressure	This category also includes wide-ranging pressures, to which the majority of the population or the area were exposed.
minority <50%	less than 50% of the population (or the area) reported in the Member State’s biogeographical region is affected by the pressure	This category includes pressures that were spatially restricted or to which only small parts of the population or the area were exposed.

Influence

According to SSIC's interpretation, 'influence' is assessed at the biogeographical regional scale but within the 'scope' of the pressure. This means that 'influence' reflects the pressure's actual impact during 2019-2024 on the exposed proportion of the focal parameter[1] within the region concerned.

According to SSIC's interpretation, 'influence' ranks the adverse effects of a pressure on the overall, long-term trend of the focal parameter. DG Environment (2022b, 2023) uses the term 'decline' to describe how 'influence' is assessed. SSIC interprets 'decline' to mean any adverse effects caused by the pressure within its 'scope' **(Figure 1**). Therefore, the term 'adverse effects' is hereafter used instead of 'decline'. Typically, adverse effects imply direct losses of individuals (e.g. from hunting) or area (e.g. from deforestation). However, adverse effects may also signify that the pressure has impeded regeneration of individuals or area. Accordingly, the 'influence' of ongoing pressures is assessed independently of the focal parameter's short-term trend (2013-2024) or the overall conservation status trend (cf. DG Environment 2022b).

SSIC defines 'long-term' as the time needed for a species' population size (or habitat area) or a habitat type's area (or conditions) to reach a stochastic equilibrium, assuming continued adverse effects of the pressure – such as losses – at the magnitude observed within the defined 'scope' during 2019-2024. The duration of this period depends on the biology of the species or habitat type, with shorter timelines for those with brief generation cycles and longer ones for those with long generation times.

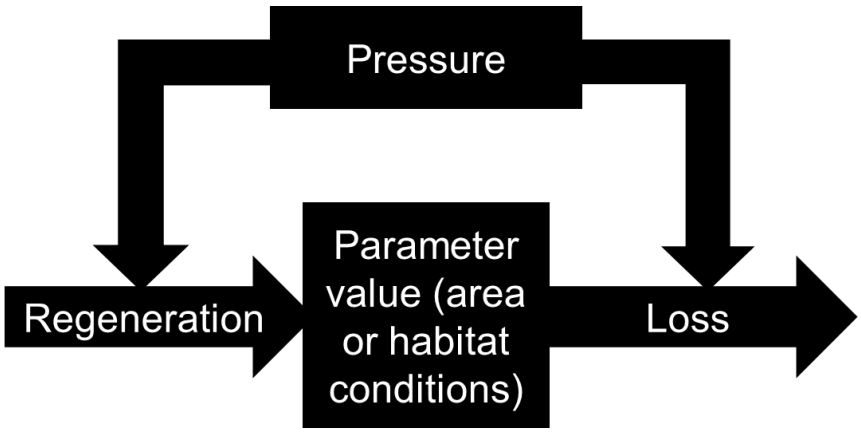

Figure 1. The term 'decline', as used by DG Environment (2022b, 2023), is interpreted by the Swedish Species Information Centre to refer to any adverse effects caused by the pressure. This includes losses or impeded regeneration resulting from the pressure within its 'scope' during 2019-2024.

[1] For species, the assessment of 'ongoing' pressures considers two parameters at the regional scale: 1) population size and 2) occupied habitat area and quality. Similarly, for habitat types, the assessment includes two parameters: 1) area and 2) habitat conditions.

Thus, the assessment of 'influence' must consider the biology of the focal species or habitat type. Therefore, setting generic, numerical threshold values is not feasible. Instead, the assessment should be based on case-specific information about the individual pressure and the biology of the focal species or habitat type in the region concerned.

SSIC's method assesses the extent to which a given pressure, within its 'scope' and independently of other pressures, influences the long-term overall trend of the focal parameter. Adverse effects that allow trends to remain stable (but not increasing) indicate a 'medium influence'. If the pressure alone does not preclude the parameter from increasing, the 'influence' is considered 'low'. Conversely, if the pressure results in a decreasing trend, the 'influence' is classified as 'high'. Furthermore, small and fragmented species populations, resulting from historical and ongoing land uses and other human impacts, often exhibit very low or near zero growth rates (**Appendix 1**). Therefore, past-land use changes may exert a pressure of 'high influence', posing a risk of extinction or preventing recovery of species populations.

Assessment based on sustained-yield harvesting models

To support the assessment method, a theoretical, conceptual model reflecting the biology of the focal parameter should preferably be used as a basis. Different models may be adopted for different species and habitat types, depending on the pressure and the specific parameters. As a general basis, SSIC uses two deterministic sustained-yield harvesting models. The first one is referred to as the 'population-unit model' as it quantifies population sizes in terms of population units[2], such as individuals. It is mainly used to evaluate pressures on population sizes of Annex II, IV, and V species, as well as those of characteristic and typical species of Annex I habitat types, since these species represent fundamental aspects of habitat types' habitat-condition parameter.

The second conceptual model is called the 'area-unit model'. It is employed to evaluate pressures on parameters measured in area units. Hence, it is applicable to the habitat of Annex II, IV, and V species, as well as Annex I habitat types. The models are explained in **Appendix 1** of this report.

It should be noted that both models assume that a 'medium influence' occurs at a threshold adverse effect, resulting in a stable overall, long-term trend. However, this threshold is rarely precise due to the range of variability of the focal parameter and statistical uncertainty. Therefore, a range of adverse effects represent 'medium influence', while rates below or above this range result in 'low' or 'high influence'.

[2] The term 'reporting units' is used by DG Environment (2023) for quantifying species population size.

Assessment generally necessitates extrapolation and expert judgement

Assessing the 'influence' through the sustained-yield models in **Appendix 1** requires case-specific information about the actual adverse effect caused by the individual pressure during 2019-2024, as well as the current value of the focal parameter and its regeneration rate. However, such detailed information is often unavailable. Consequently, the assessment needs to rely on extrapolation and expert judgement based on the best available knowledge about the focal parameter and the pressures affecting it. The assessment follows a stepwise approach:

1. *Information on adverse effects:* There must be information indicating how and to what extent the individual pressure, but also other pressures, adversely affects the parameter, preferably at regional scale.
2. *Long-term trend information:* The assessment relies on long-term trend information of the focal parameter or an indicator within the 'scope' of the pressure, underpinned by theoretical reasoning from the sustained-yield models in **Appendix 1**. An 'indicator' reflects an important aspect of the focal parameter or is ecologically or statistically related to it.
3. *Independent impact assessment based on 1 and 2:* The impact of the pressure alone, independently of other pressures, is assessed. The key question is: will the observed long-term trend change if the effects of all other pressures are removed?

Ranking the 'influence' (step 3) is complex. Sound extrapolation requires reliable information on both 1) the adverse effects and 2) the likely consequences for the trend. This ranking corresponds to method 'b', as outlined in a separate chapter of this report. When such information is lacking, expert judgement (method 'c') serves as the alternative.

If the trend has been increasing over time, it is expected to continue increasing if all other pressures are removed, meaning the 'influence' of the pressure can be ranked as no more than 'low' (**Figure 2**). If the trend has been stable, it may either remain stable or begin to increase once other pressures are removed. In this case, 'influence' can be considered either 'medium' or 'low'. A 'medium' influence, however, is only expected if the pressure exerts a significantly stronger adverse effect than other pressures and is likely the main driver of the observed trend.

Similarly, if the trend has been decreasing, it can continue to decrease, stabilize or even start increasing once other pressures are removed. Thus, the 'influence' may be ranked as 'high', 'medium' or 'low'. However, a 'high' influence is only expected if the pressure is likely the main driver of the observed trend (**Figure 2**).

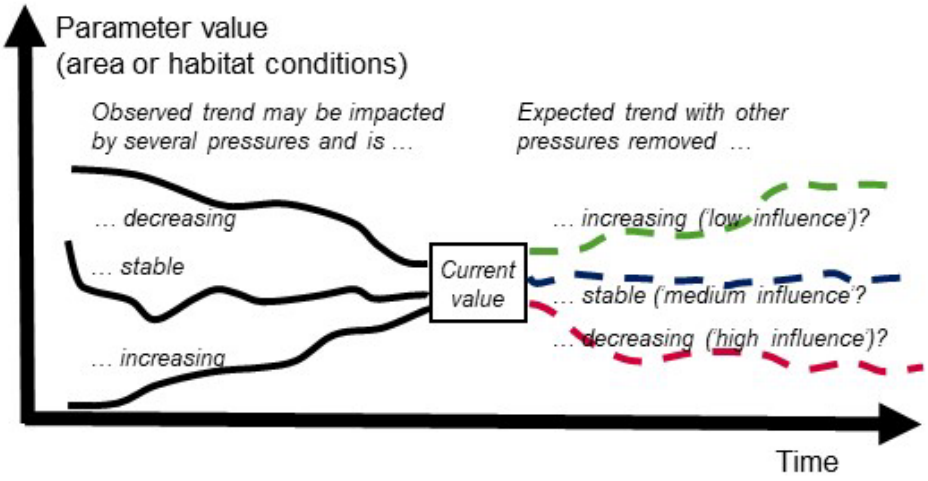

Figure 2. The assessment of 'influence' based on extrapolation or expert judgment relies on 1) information about the pressure's adverse effects and 2) long-term trend information for the focal parameter (e.g. population size or area) or a related indicator. This assessment evaluate how the observed long-term trend and current value of the indicator would change if the adverse effects of all other pressures were removed. See text for further explanation.

SSIC's criteria used for assessing 'influence' are given below. 'Alone' refers to the individual impact of the pressure, assessed independently of other pressures. The term 'adverse effects' is used by SSIC instead of 'decline'. It includes any adverse effects, including losses or impeded regeneration, caused by the pressure within its 'scope' (see explanation above).

DG Environment's (2022b) explanatory notes: Influence (on population or habitat of the species) (or on area or habitat condition of the habitat type) [*to be completed for 'ongoing' and 'ongoing and likely to be in the future' timings only. Although the latter also includes threats, the 'scope' and 'influence' will only address pressures]		**SSIC's interpretations:**
High influence	The pressure listed is a highly significant factor contributing to the decline of the population or the habitat of the species (or the area or the habitat condition of the habitat type). It is an important direct or immediate influence on the population or habitat of the species (or the area or habitat condition of the habitat type).	The adverse effect of the pressure alone results in an overall long-term decreasing trend for the parameter[3] within the 'scope'. There are effects directly resulting from the pressure itself. These effects occur immediately when the pressure is present.
Medium influence	The pressure listed contributes to the decline of the population or habitat of the species (or the area or habitat condition of the habitat type) but is not a high influence nor a low influence pressure. It has a medium direct/immediate or indirect influence on the population or habitat of the species. (or the area or habitat condition of the habitat type)	The adverse effect of the pressure alone does not preclude an overall stable trend for the parameter[3] within the 'scope' (but it precludes an overall increasing trend). The pressure may have just an 'indirect influence', which refers to secondary effects stemming from processes triggered by the pressure.
Low influence	The pressure listed contributes to the decline of the population or habitat of the species (or the area or habitat condition of the habitat type), although not the main contributor and in combination with other pressures and/or factors.	The adverse effect of the pressure alone does not preclude an overall increasing trend for the parameter[3] within the 'scope'. The pressure acts in combination with those from the other two categories. Its impact still warrants consideration in conservation and management measures. Note that together can several pressures with 'low' 'influence' result in an overall decreasing trend.

[3] For species, the assessment of pressures considers two parameters at the regional scale: 1) population size and 2) occupied habitat area and quality. Similarly, for habitat types, the assessment includes two parameters: 1) area and 2) habitat conditions.

The pressure's overall impact

According to DG Environment's (2023) guidelines, the 'overall impact' of a pressure is categorized into three classes: 'high', 'medium' and 'low' importance. The table below is provided by DG Environment (2023) and shows that the 'overall impact' is determined by both 'scope' and 'influence' (**Figure 3**). It is 'high' only when at least one of the variables is in the highest category and the other is at least in the medium category.

The 'overall impact' is optional and not included in the reporting format (DG Environment 2022a), but may facilitate communication of assessment results to stakeholders.

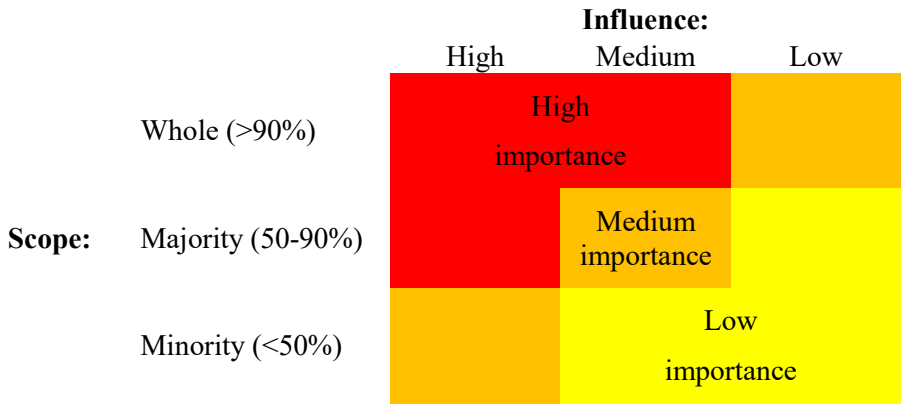

Figure 3. The 'overall impact' as a function of the 'scope' and 'influence. (DG Environment 2023).

Method used

Assessing the method used for assessing pressures and threats is optional, but specifying the type of information on which the assessment is based is valuable. This serves as a quality declaration, indicating the robustness of the assessment and the need of additional information. Assessing the method also facilitates communication of assessment results to stakeholders.

Four categories (a-c) are used for this assessment, reflecting the extent and effectiveness of data collection in capturing the pressure's true impact on the focal parameter. To be included in the highest category (a), SSIC interprets that a method must meet the following criteria:

1. The assessment must be based on data from a 'complete survey' or a 'statistically robust estimate' from a well-designed sample-based survey of the focal parameter. A 'complete survey' refers to comprehensive mapping, while a 'statistically robust estimate' entails a reliable estimate derived from mapping or sampling.
2. The assessment must demonstrate both high accuracy (representativeness or agreement with the 'true value') and precision (consistency of measurements). This implies that the estimates used must have a relative error of no more than 25%[4] (Dahlberg & Nilsson 2023; Hedenås et al. 2022).

'Methods' not meeting these criteria are placed in lower categories (b-d). See the table below for further explanations.

[4] This is a rough rule-by-thumb criterion. The variance level allows for detecting a decreasing trend of ca 20-35% over 10 years (2-3% per year on average) with 80% power and a 10% error probability. This criterion is used for the highest category (a) in the method for reporting a 12-year decreasing trend in main parameters: 'population size' of species and 'surface area' of habitat types (see Chapters 6.10-6.11, Part B, and Chapters 5.7-5.8, Part D, of DG Environment's (2022b) Explanatory Notes).

DG Environment's (2022b) explanatory notes: **Methods used (optional)**	**SSIC's interpretations:**
The optional methods used field is to provide general information for the pressures reporting and is not required for specific pressures. Where a specific methodology is used for a specific pressure this information can be provided in field 7.4 Additional information. Choose one of the following categories: a) complete survey or a statistically robust estimate b) based mainly on extrapolation from a limited amount of data c) based mainly on expert opinion with very limited data d) insufficient or no data available. Only one category can be chosen; where data have been compiled from a variety of sources, choose the category for the most important source of data	In a), 'complete survey' signifies a comprehensive mapping of the focal parameter, while 'statistically robust estimate' refers to estimates derived from mapping or sample-based surveys. These methods meet two criteria: 1) high accuracy (representativeness or agreement with 'true value') and 2) high precision (consistency or detail of measurements). In both cases, 'high' implies a relative error of no more than 25% of estimates. In b), 'extrapolation from a limited amount of data' implies that the criteria for category a) are not met. However, there are either 'complete surveys', 'sample-based surveys' or research results that can be assumed to correlate with the focal parameter and thus be used as a basis for assessment. This implies a relative error of no more than 60% of estimates. In c), 'expert opinion' implies that the criteria for neither category a) nor b) are met. However, there is some useful information upon which expert judgement can be based.

Criteria for selecting which pressures to address and which pressure codes to use

DG Environment (2022b, 2024) identifies nearly 180 pressure codes and allows a maximum of 20 pressure codes to be used when addressing potential pressures on a habitat type within a region. These codes ('PA01', 'PA02', etc.) are grouped under different sectors, such as 'PA Agriculture related practices' and 'PB Forestry related practices', with a brief description accompanying each code. This framework raises questions about how to prioritize which pressures to address and which codes to adopt.

The rational for addressing a specific pressure on a habitat type within a region must be compelling from a conservation perspective. Furthermore, addressing a pressure must be justifiable, as gathering, analysing and documenting the necessary information for each pressure-habitat type-region combination is labour-intensive and time-consuming. The following criteria are applied by SSIC to guide these decisions (a key is found in **Appendix 2**):

Information

There must be available information indicating the pressure's 'scope' and 'influence' at regional scale during 2019-2024. If such information is lacking, the assessment will rely solely on 'expert judgement'. This information criterion applies irrespective of the pressure's level of 'overall impact' (**Figure 3**). If a group of pressures are addressed under a broad pressure code, sufficient information must be available on the 'scope' and 'influence' of at least some of these pressures to ensure that their collective 'overall impact' is at least 'medium importance'.

Importance in terms of 'overall impact'

To be addressed individually under a specific code, a pressure must have at least 'medium importance' in terms of its 'overall impact' on at least one habitat type within a region. This impact level is determined by the combined 'scope' and 'influence' at the biogeographic regional scale during 2019-2024 (**Figure 3**). A pressure with such an 'overall impact' warrants consideration in conservation and management measures. Once identified, the pressure is assessed across all relevant habitat types and regions and addressed accordingly.

A pressure classified as having only 'low importance' across all habitat types and regions should not be addressed. However, it may still be considered under two conditions. First, if its' adverse effects compound those of a pressure with 'medium importance', it can be addressed under its own code or grouped with other low-impact pressures with similar effects under a broader code. Second, if it together with other low-impact pressures have collective adverse effects of 'medium importance', it may be addressed together with these pressures under a broader code. When grouped pressures have different sectoral drivers, a broader, non-sector specific code ('PL05 Modification of hydrological flow (mixed or unknown drivers)') is adopted.

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Appendix 1. Ecological models used to evaluate pressures' 'influence'

To support the assessment of a pressure's 'influence', a theoretical, conceptual model reflecting the biology of the focal parameter[5] should preferably be used as a basis. Different models may be adopted for different species and habitat types, depending on the specific parameters under pressure.

SSIC uses two deterministic sustained-yield harvesting models. The first one is referred to as the 'population-unit model' as it quantifies population sizes in terms of population units[6], such as individuals. It is used to evaluate pressures on population sizes of Annex II, IV, and V species, as well as those of characteristic and typical species of Annex I habitat types, since these species represent fundamental aspects of habitat types' habitat-condition parameter.

The second model is called the 'area-unit model'. It is employed to evaluate pressures on parameters measured in area units. Hence, it is applicable to the habitat of certain Annex II, IV, and V species, as well as Annex I habitat types.

The population-unit model

The model is represented by the logistic-growth model (Schaefer 1954; Begon et al. 1986; **Fig A1.1**). Accordingly, the 'influence' depends on the current population size and how fast the population grows within the pressure's 'scope'. According to the model, populations tend to stabilize as long as they are large enough to renew themselves at a rate that matches the adverse effect in terms of losses induced by the pressure. As an example, hunting may currently induce an 10% annual loss, but still maintain a stable population size of the brown bear (*Ursus arctos*) in Sweden, i.e. hunting at that rate has 'medium influence'. The current population size is under the carrying capacity, but sufficiently large to produce a surplus of bears that can be harvested without reducing population size.

A higher rate of hunting would result in a 'high influence', causing the population to shrink. Thus, the current population size would not be maintained, though it might stabilize at a lower level. However, for species with small current population sizes, the growth rate can be very low or near zero simply due to the limited number of reproducing units (individuals). Any rate of loss induced by the pressure may then have 'high influence'.

[5] For species, the assessment of pressures considers two parameters at the regional scale: 1) population size or 2) occupied habitat area and quality, or both. Similarly, for habitat types, the assessment includes two parameters: 1) area, 2) habitat conditions, or both

[6] The term 'reporting units' is used by DG Environment (2023) for quantifying species population size.

The area-unit model

The model, formulated by SSIC, assumes that regenerating an area unit of a habitat type, once lost, takes on average a specific amount of time. The 'influence' of a pressure therefore depends on the extent to which the pressure's adverse effect is counteracted by regeneration.

In the model, the habitat type's expected total potential area within the 'scope' of the pressure A_t is the sum of its current area A_c and its potential area A_p, where the habitat type potentially can form but the conditions currently does not meet the criteria of the habitat type. The loss induced by the pressure signifies that a specific area a_l has been lost from the current area A_c of the habitat type during 2019-2025. This translates into an average annual rate of loss $d = a_l/(6 \times A_c)$. The regeneration to offset the loss takes place in the potential area A_p within the pressure's 'scope'. The maximum long-term average rate of regeneration that can be attained while offsetting d and maintaining status quo of current A_c versus potential A_p area is given by the product $(1/g) \times A_p$, where g is the regeneration time in years of an area unit. Hence, this product equals a threshold t, representing the maximum rate at which a habitat type can be lost without reducing its current area A_c over the long term within the pressure's 'scope'.

A pressure's 'influence' is assessed by comparing d with the threshold t. A rate of loss d at the threshold t implies no long-term change in the current area, indicating a 'medium influence'. Higher rates of 'decline' result in a 'high influence', leading to a reduction in the current area, which would not be maintained and may stabilize at a lower level.

The threshold function $f(t) = (1/g) \times A_p$ can be reformulated as $f(t) = r \times (A_t - A_c)$, where r is the expected intrinsic rate of regeneration of the habitat type and A_t is the total area, i.e. the sum of A_c and A_p, the habitat type's current and potential area. By dividing with A_t, a general function is achieved: $f(t) = r \times (1 - p)$, where p represents the proportion of the habitat type's current area compared to its expected total potential area within the 'scope' of the pressure.

According to the general model function, the threshold t for 'medium influence' is much lower than r when p is close to 1, but it approaches r as p decreases (**Fig A1.2**). A small current area (low p) can be more easily maintained at a specific r than a large current area (high p). However, it should be noted that t essentially equals the habitat type's intrinsic rate of regeneration r regardless of p when r is very small, i.e. for habitat types that regenerate over a very long periods, such as more than 1,000 years ($r < 0.001$; **Fig A1.2**). Thus, pressures inducing any rate of loss may have 'high influence' on the area of such slowly-renewable habitat types. Likewise, pressures resulting in irreversible losses, where habitat types cannot be renewed ($r = 0$), have 'high influence'. It should also be noted that some pressures can have adverse effects not only by causing an adverse effect through loss of area, but also by impeding the regeneration of the habitat or habitat type concerned. In such cases, the computation of the threshold t for 'medium influence' needs to be adjusted to account for the lower rate of regeneration r.

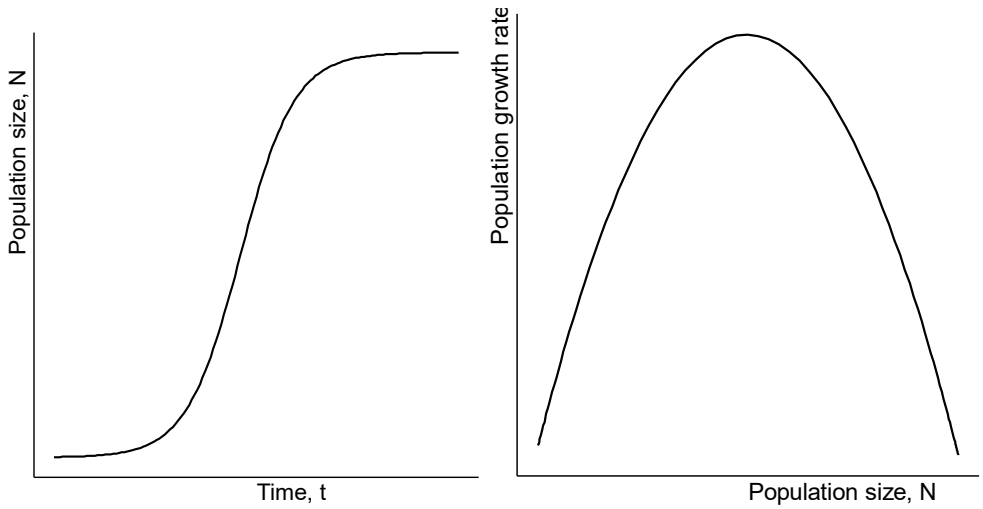

Fig. A1.1. The population-unit model used to evaluate pressures on population size of species is conceptualized with the classical logistic model of population growth. The population size *N* is quantified in population units (individuals), and its growth rate (the derivative *dN*/*dt*) varies with population size, ranging from zero when there is no reproducing individuals to a maximum at the carrying capacity. According to the model, populations tend to stabilize as long as they are sufficiently large to renew themselves at a rate that matches the adverse effect in terms of loss induced by the pressure. As the current population size is maintained and the overall, long-term trend is stable, the 'influence' is considered 'medium'. Increasing trends imply 'low influence, while decreasing trends imply 'high influence'. At small population sizes, the growth rate is very low or near zero. Consequently, any rate of loss may have a 'high influence' leading to extinction or preventing the species from recovering within the 'scope' of the pressure.

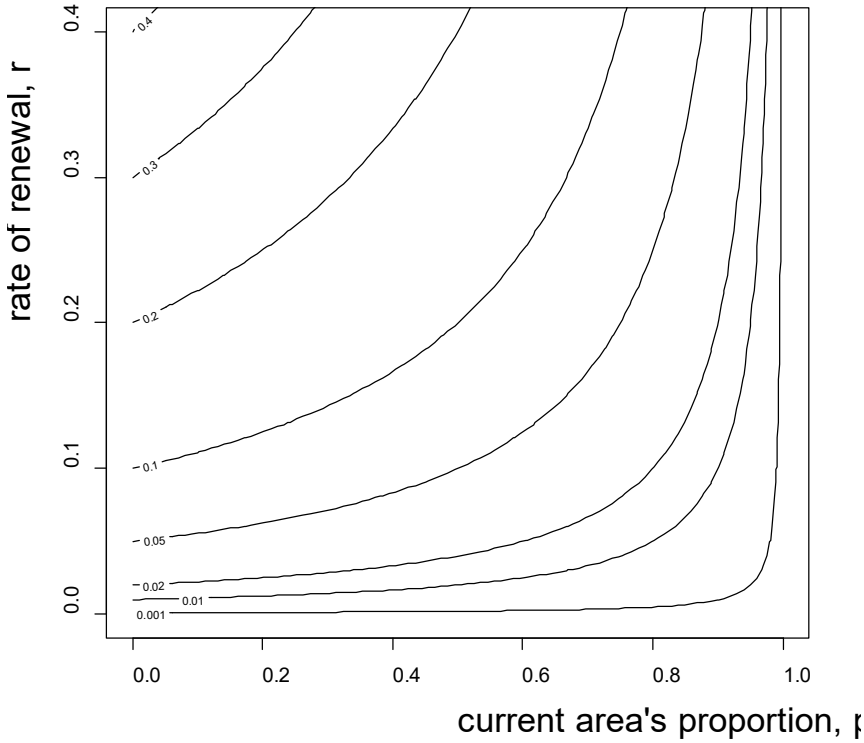

Fig. A1.2. The area-unit model used to evaluate pressures on the area of species' habitats or habitat types is conceptualized with a linear model formulated by the Swedish Species Information Centre. The current area is quantified in area units and represents a certain proportion *p* of the habitat type's expected total potential area within the 'scope' of the pressure. An area unit of the habitat type is renewed over a certain time *g*, which translates into an intrinsic rate of regeneration $r = 1/g$. The 'influence' of a pressure causing a certain rate of loss depends on the habitat type's current proportion *p*, as well as its intrinsic rate of regeneration *r* within the 'scope' of the pressure. The threshold *t* for a rate of loss resulting in no long-term change in the current area, indicating a 'medium influence', is computed with the function $f(t) = r \times (1 - p)$. Accordingly, the threshold *t* is much lower than *r* when *p* is close to 1, but it approaches *r* with decreasing *p*, as a small current area (low *p*) can be more easily maintained at a specific *r* than a large current area (high *p*). At long regeneration time *g* and low *r*, any rate of loss may have 'high influence'. Only some isoclines of *t* are shown across a limited range of $r = 0$ to 0.4, corresponding to *g* decreasing from infinity down to 2.5 years.

Appendix 2. Key for decision on pressures and codes

1. The pressure has **'medium or high importance'** in terms of 'overall impact' for at least one habitat type within a region:
    - Address the pressure individually under a specific code
    - Assess the pressure across all relevant habitat types and regions

2. The pressure has **'low importance'** across all habitat types and regions:
    - It compounds a pressure with 'medium or high importance':
        - Address it individually under its own code, or
        - Group it with the other and similar pressures under a broader code (proceed to step 3).
    - It contributes together with other low-impact pressures to collective effects that is of 'medium or high importance':
        - Address it together with these pressures under a broader code (proceed to step 3)
3. The **grouped pressures** have the same sectoral driver:
    - YES: Use a broader, sector-specific code (e.g. 'PB02 Conversion from one type of forestry land use to another' for addressing effects of various forestry activities)
    - NO: Use a broader, non-sector-specific code (e.g. 'PL05 Modification of hydrological flow (mixed or unknown drivers)' for addressing effects of various human alternations of hydrological conditions)