# CURRENT LEGAL STATUS REGARDING RELEASE OF NON-NATIVE PLANTS AND ANIMALS IN GERMANY

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## Abstract

In this paper the law and practice in Germany of the release of non-native species into the wild is discussed. Major results are the following:

Applications for and authorization of releases are rare in Germany. It appears that the legal framing of releases in Germany does not adequately grasp the case of unintended release. In this context the privilege of agriculture and forestry needs to be discussed.

The German licensing criteria for releases including the methodology of risk assessment need to be further developed. Risk assessment methods as developed for releasing genetically modified organisms may be consulted. On the long run a joint regulation of both non-native and genetically modified organisms may be envisaged.

## Introduction

The extinction of species is everywhere in the public eye, but alongside this process native flora and fauna are increasingly being influenced and modified by the proliferation of alien plant and animal species. Biological invasions are becoming recognized as a world-wide problem for nature conservation, and there is a growing demand for some form of regulatory response to this problem (Sjöberg and Hokkanen 1996; Office of Technology Assessment (U.S. Congress) 1993). The question we shall address here is whether current legislation in Germany can respond adequately to the constellation of problems which arise from this. We shall begin by examining the various ways in which they can be regulated at national level. The international community has addressed the protection of species in a range of conventions. The present paper will examine whether existing national regulations reflect international requirements, to the extent that the European Community has adopted such requirements on behalf of Member States. After that the licensing practice will be discussed followed by a comparison of the regulation of genetically modified organisms with non-native organisms.

The concept of release (in German: *Ausbringung*) is not used in any of the relevant regulations. In this study, release is used as a generic term to convey the various legal concepts applied to the fact. It embraces all ways in which non-native animals and plants are introduced into the environment.

*Plant Invasions: Ecological Mechanisms and Human Responses, pp. 71–83*
*edited by U. Starfinger, K. Edwards, I. Kowarik and M. Williamson*

## National law

The framework legislation in Germany for central protective regulation covering the release of alien animals and plants is defined in the Federal Nature Conservation Act, which applies nation-wide, and in the Conservation Acts adopted by each of the *Länder*, or federal states. The release of non-native fish is covered by specific fisheries legislation. In Germany, it is a federal responsibility to regulate marine and coastal fishing. The *Länder* are responsible for inland waters. Relevant provisions are also found in hunting, forestry law, agricultural law, and law relating to pesticides, the protection of animals, and epidemics.

### *The Federal Nature Conservation Act*

§ 20 d para. 2 of this Act sets out framework provisions for the release of non-native animals and plants into the environment: "Alien wild and non-wild species of animals and plants may only be set free or introduced into the wild if permission is granted by the authority responsible under state law. This does not apply to the cultivation of plants in agriculture and forestry. Permission shall be refused if the danger cannot be ruled out that the native community of flora and fauna will be contaminated (in German: *Verfälschung*) or that the survival or propagation of native species of wild animals or plants or of populations of such species will be placed at risk." The Federal Nature Conservation Act also includes import regulations and rules with regard to control.

We shall begin below by describing and discussing the field of application of § 20 d para. 2 of the Act and the licensing conditions. We shall then look at the relevant provisions in the amendment to this Act.

#### *Field of application of § 20 d para. 2 / Federal Nature Conservation Act*

§ 20 d para. 2 of the Federal Nature Conservation Act requires a licence for the release of alien wild and non-wild species of animals and plants (Fig. 1). The rule covers two types of release of alien animals and plants into the environment: one is *setting free* (German: *Aussetzen)* and the other is *introduction* (German: *Ansiedeln)* in the wild. "Setting free" is defined unanimously in the literature as "leaving to its own devices", i.e. the party responsible for the release does not thereafter tend to the specimens or provide in any way for their survival.[1] "Introduction", on the other hand, is taken to mean the planned input of animals with a view to establishing a local population, or the sowing, cultivation or other release of plants, both of these usually in conjunction with some form of care.[2]

The terms animals and plants as applied by § 20 d para. 2 are broadly defined. In line with § 20 a para. 1 no. 1 lit. b and no. 2 lit. b of the same Act, the "eggs, larvae, pupae and other developmental forms" of animals and the "seeds, fruits and other developmental forms" of plants must also be covered, as their release can also induce the establishment of alien species of flora and fauna. The definition of animals and plants reflects the scientific terminology.[3] However, it has not yet been possible to clarify whether micro-organisms fall under the field of application, and if so, which.

[1]Gassner, § 20 d marginal 9, Kolodziejcok, § 20 d marginal 21, Ebersbach, p. 198, Müller-Boge, p. 17, Apfelbacher, p. 251. See also BT-Drs. 10/5064, p. 19.

[2]Gassner, § 20 d marginal 9, Kolodziejcok, § 20 d marginal 21, Ebersbach, p. 198, Müller-Boge, p. 17, Apfelbacher, p. 251.

| Federal Nature Conservation Act § 20 d para. 2 | **The Wild** | **Settled Areas** |
|---|---|---|
| **Plants:** | | |
| setting free (negligent conduct) | no licensing required | no licensing required |
| introduction (activity conforms to a plan) | **licensing required** | **no licence required** (cultivating alien plants in agriculture and forestry) |
| **Animals:** | | |
| setting free (negligent conduct) | **licensing required** | **licensing required *** |
| introduction (activity conforms to a plan) | **licensing required** | **licensing required** |

***but no longer when the amendment to the Federal Nature Conservation Act is implemented**

*Fig. 1.* Field of application of § 20 d para. 2 of the Federal Nature Conservation Act (Germany)

"Alien" in the sense of § 20 d para. 2 applies to any species not or no longer encountered in the locality in which it is to be released. The geographical reference here is, therefore, to the area in which the specific release is to take place.[4] A non-indigenous sub-species of a native species may also be alien (§ 20 a para. 3 of the Federal Nature Conservation Act). The purpose of this distinction is to prevent alien sub-species from displacing native related species by interbreeding.[5]

In terms of time, the decision depends on the natural state of a specific area at the moment of licensing. It is of no significance whether the species or sub-species has ever been established in that area or anywhere else in Germany in the past. In other words, the re-introduction of species which were once established in Germany but had been displaced at the time of application would fall under § 20 d para. 2 of the Federal Nature Conservation Act.

The release of *non-wild species* of animals and plants also calls for a licence. This means, in particular, that the setting free of alien domesticated animals also falls under the licensing requirement in § 20 d para. 2.

Whereas introduction assumes that the activity conforms to a plan, setting free could conceivably imply negligent conduct.[6]

According to the text of the law, *introduction of plants only requires licensing if it occurs in the wild*. If we follow the wording, this qualification does not apply to setting free. The wild is equated with unpopulated areas as defined in § 1 para. 1 of the Federal Nature Conservation Act.[7]

[3]Cf. § 20 a para. 3 Federal Nature Conservation Act.

[4]Ebersbach, p. 197 ff., Gassner, § 20 d marginal 9, Kolodziejcok, § 20 d marginal 19, Müller-Boge, p. 18.

[5]Battefeld, § 25 marginal 8.

[6]Kolodziejcok, § 20 d marginal 21, Ebersbach, p. 198, Müller-Boge, p. 18, Apfelbacher, p. 251.

[7]Kolodziejcok, § 20 a marginal 29. Similarly Ebersbach, p. 198.

The cultivation of ornamental or useful plants in gardens, allotments, parks, cemeteries, other green spaces created within settlements and comparable spaces serving human use is not seen as falling within the sphere of "the wild", given that the vegetation on such land is essentially artificial, having been placed there by human hand.[8] Whereas sowing seeds on a bank dividing arable farm land would fall within the sphere of "the wild" .

No licence is required under § 20 d para. 2 clause 2 of the Federal Nature Conservation Act for cultivating alien plants within the framework of agriculture or forestry. This exemption applies primarily to useful crops and cultivated plants.[9] The release of alien animals, however, must under the terms of § 20 d para. 2 be licensed, even if it occurs within the framework of agriculture or forestry.

*Conditions of licence*

According to § 20 d para. 2 clause 3 of the Act, permission "shall be refused if the danger cannot be ruled out that the native community of flora and fauna will be contaminated or that the survival or propagation of native species of wild animals or plants or of populations of such species will be placed at risk." There is no case law to date to clarify the interpretation of these conditions of licence, since no court has yet passed down a verdict either on § 20 d para. 2 of the Federal Nature Conservation Act or on the regulations for implementation adopted by the *Länder*. A universally understood interpretation of the terms "contamination", "danger to survival" etc. is still also under discussion from the scientific point-of-view;[10] all we have at present are a number of case studies.

The first factor to bear in mind is that the purpose of both conditions is to protect *native* flora and fauna. In this respect, § 20 a para. 4 clause 1 of the Federal Nature Conservation Act contains a legal definition, according to which an animal or plant living in the wild is native if "the area of occurrence or regular migration lies or has in the course of history lain fully or partly within the area covered by this Act or is spreading by natural means into the area to which this Act applies". According to § 20 a para. 4 clause 2 of the Federal Nature Conservation Act, a wild species of animal or plant should also be regarded as native if "animals and plants of the relevant species which have turned wild or were introduced under human influence survive as a population in the wild over several generations without human aid in the area covered by this Act". An alien species under § 20 d para. 2 of the Federal Nature Conservation Act may, therefore, nevertheless be "native" in the sense of § 20 a para. 4 of the same Act if it is established in or regularly migrates to another part of Germany (which is the area covered by this Act) or if it has done so at an earlier date (in the course of history).[11]

Under § 20 d para. 2 clause 3 of the Act, a danger to native species must be ruled out in order to obtain a licence. It follows from this that the danger does not have to be demonstrated positively. To refuse a licence, it is sufficient for the authority to have some indication that the native community of flora and fauna is jeopardised.[12] The applicant must then prove that the danger definitively does not exist. The upshot of §

[8]Kolodziejcok, § 20 d marginal 28, Meßerschmidt, § 20 d marginal 6.
[9]Apfelbacher, p. 252.
[10]Auhagen, p. 15 ff.
[11]Gassner, § 20 d marginal 9, Kolodziejcok, § 20 d marginal 19.
[12]See also Schink, p. 452, as well as Battefeld § 25 marginal 14.

20 d para. 2 clause 3, therefore, is that the burden of proof lies with the applicant. However, as the decision is founded on a forecast, exaggerated expectations cannot be levelled at the furnishing of evidence, especially as proof of the contrary cannot be provided with absolute certainty.[13]

*Assessment*

It is recommended that negligent behaviour be incorporated into the restrictions of § 20 d para. 2 of the Act, because this provides the basis for monitoring provisions.[14]

There is a problem here in that introduction of plants only requires licensing when it takes place in the wild. No licence is required for introducing alien plants in settlement areas or artificially maintained spaces such as parks. This granting of privilege is not, however, convincing, as alien plants can spread beyond these sites.[15] In addition, they can cause on site damage. Finally, exempting cultivated landscapes contradicts the aim of the legislation, as it is above all on sites such as these that the planned introduction of alien plants occurs. Most neophytes began by being cultivated for ornamental purposes, especially in parks and gardens, only to spread from there "into the wild".[16]

The final criticism refers to the exemption of agriculture and forestry. In the forestry sector at least, the release of alien woody species has already caused ecological damage.[17] So far ecological risks have primarily been induced by the release of alien plants, both ornamental and crop plants.[18] After all, plants cultivated for agriculture and forestry can run wild, generating ecological changes.

Another aspect which merits discussion is that § 20 d para. 2 of the Federal Nature Conservation Act describes two different constellations, yet stipulates the same conditions for both. This is due to the fact that alien species of animals and plants can also be native if they formerly occurred elsewhere in Germany as mentioned in § 20 a para. 4 of the Act. This means that § 20 d para. 2 refers on the one hand to the release of alien species of animals and plants not previously encountered in Germany (henceforth: first introduction) and on the other to the re-introduction of animal and plant species which were formerly native.

One argument in favour of a legal distinction between first and re-introduction is that, whereas the introduction of previously unknown alien species would lead to increasingly similar communities the world over,[19] re-introduction can stabilise and consolidate regional specificity. In other words, re-introduction can in itself be an asset. This should be taken into consideration in the legal regulation of the issue. This fundamental assessment is not refuted by the fact that re-introductions are not in themselves accompanied by lesser ecological risks than first introductions.[20]

[13]Gassner, § 20 d marginal 12.

[14]As opposed to extending the duty to obtain a licence in Blum, § 44 marginal 1, which would mean a substantial proliferation of duties to monitor.

[15]Cf. Kowarik, p. 44 on the spread of non-native woody plants beyond the borders of settlement areas.

[16]Kübler, p. 89 ff. and Sukopp, p. 14 ff. See also Battefeld, § 25 marginal 9, who cites as examples the angelica tree, Canadian goldenrod and the giant varieties of knotgrass, etc. These species, he maintains, have in some instances displaced native ones.

[17]Cf. Knoerzer, p. 67 ff. on the proliferation of the Douglas fir and Kowarik, p. 44 ff. on the spread of Black Locust and the Black Cherry.

[18]Sukopp, p. 14.

[19]Sukopp's reasoning, p. 3 ff.

[20]Reichholf, p. 37 ff.

Both constellations confront a problem in that § 20 a para. 4 clause 2 of the Federal Nature Conservation Act also regards species as native, and therefore worthy of protection, when they have been released by humans and survived in the wild for several generations. The consequence of this provision is that formerly alien species which have become established are covered by the protective aim of § 20 d para. 2 of the Act, regardless of whether they themselves cause ecological damage. In this way, the late black cherry from North America would be deemed a native of Berlin's forests, according to the legal definition, deserving protection from any new alien species and in accordance with the general rules. In this respect, the legislature is called upon to offer clarification.

*Import regulations*

Native flora and fauna can also be protected by regulating the import of alien animals and plants. Under § 21 a para. 1 clause 1 no. 3 of the Federal Nature Conservation Act, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is empowered to issue ordinances prohibiting the import of certain animal and plant species not covered by the EC's CITES Regulation[21] or else to make such import dependent on a licence under § 21 b of the Federal Nature Conservation Act if this is necessary because of a danger "that the native community of flora and fauna will be contaminated or that the survival or propagation of native species of wild animals or plants or of populations of such species will be placed at risk."

To date no ban on imports has been issued under § 21 a para. 1 clause 1 no. 3 of the Act. What has been introduced, however, is the requirement through § 6 para. 1 of the Federal Protection of Species Ordinance to acquire an import licence for the species named in Annex 3 column 1. The risk that native flora and fauna might be contaminated is to be seen in the cases, for example, of the dwarf gull, the grey heron, the American bullfrog, the fire-bellied salamander and so on.[22]

The Federal Nature Conservation Act does not provide adequate scope for monitoring and imposing penalties. Stipulations refer only to a universal right to information (§ 23) and a general duty to tolerate (§ 10).

*Draft Amendment to the Federal Nature Conservation Act*

The draft amendment to the Federal Nature Conservation Act[23] includes a modified text on the release of alien animals and plants. The new version envisages two major changes with regard to the issue which concerns us:

First, as opposed to setting free, only the introduction of alien animals into the wild will require licensing, as the former is covered by legislation on the protection of animals. This means that a licence will no longer be necessary, as it was, for the release of alien animals in settlement areas. § 3 no. 3 of the Protection of Animals Act prohibits the setting free of domestic animals in general.

[21]Council Regulation (EEC) no. 3236/82 of 3 December 1982 on Implementation in the Community of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, OJ L 384/1.

The Federal Nature Conservation Act has essentially transposed the provisions of the EC's CITES Regulation. On the basis of art. 15 of the Regulation, however, it was left to Member States to decide whether they wished to uphold or adopt stricter measures for various reasons, including the protection of native species.

[22]This suggests that the risk of contamination (§ 21 b para. 1 clause 1 no. 3 of the Federal Nature Conservation Act) should be assessed. Annex 3, however, consists mainly of species for which the risk of species extinction has priority.

[23]BT-Drs. 13/6441.

Secondly, the duty to obtain a licence will not apply where alien animals are used as a biological form of plant protection. The reason given for this is that licensing a plant protection method requires an assessment of its impact on the natural balance.[24]

Criticism must be levelled at the fact that in future the setting free of alien animals will not call for a licence. The reference to animal protection legislation is not acceptable because the purpose of this legislation is to protect individual animals and not nature or landscape.[25] Besides, limiting the duty to obtain a licence to release in the wild is not convincing.[26]

The time aspect in the amendment does not seem devoid of problems. Formerly native plant species which have been displaced within the last 100 years are not alien according to the legal definition in § 8 para. 2 no. 6 of the draft, so that under § 37 para. 3 clause 2 no. 2 of the draft they do not require a licence for release. This would mean that re-introduction could take place without a licence, but it does not take into account the discussion about local genetic diversity.

The criticisms outlined above also apply to the new draft. Here, again, agriculture and forestry enjoy a privileged status, and introduction of plants only requires licensing when it is to take place in the wild.

The power to issue legal ordinances granted under § 47 para. 2 no. 3 of the draft enables the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety to prohibit the possession, safekeeping and marketing – as defined in § 39 para. 1 of the draft – of non-native animal and plant species which are not specially protected if this is necessary due to the danger of contaminating the local community of fauna and flora. This means that the Federal level can even prohibit the possession and marketing of non-native species when they are not specially protected, if this serves the purpose described.

*The relationship between legislation on nature conservation and other statutes*

Under § 20 para. 2 of the Federal Nature Conservation Act, the Act's rules with regard to the protection of species and any legal provisions enacted on the basis of those rules shall be without prejudice to "the provisions of legislation governing plant protection, animal protection, epidemics, and forestry, hunting and fishery". The provisions encountered in the hunting and fishery laws broadly reflect the provisions in the Federal Nature Conservation Act. The other laws are only indirectly pertinent, given that they pursue a different purpose, and will, therefore, not be discussed here.

## Standards established under EC law

*EC legislation on the protection of species*

The EC CITES Regulation,[27] which transposed the Washington Convention on the Protection of Species, empowers Member States under art. 15 to uphold or adopt stricter

[24]Ibid. See § 15 of the Plant Protection Act.
[25]BT-Drs. 13/6441, p. 64.
[26]See above.
[27]Council Regulation (EEC) no. 3236/82 of 3 December 1982, see Fn 23.

measures in order, amongst other things, to preserve native species. The Regulation applies directly in Germany. The new EC Regulation on the Protection of Species,[28] which came into force on 1 June 1997, transfers any regulation of imports to protect native species to the European level. Pursuant to art. 4 para. 6 lit. b of the Regulation, the Commission can restrict the import – in general or in relation to specific countries of origin – of live specimens of species whose introduction into the natural habitat of the Community has been proven to pose an ecological threat to indigenous species of animals and plants living in the Community in a wild state.

*Bird Conservation Directive and Flora Fauna Habitat Directive*

The Bird Conservation Directive[29] and Flora Fauna Habitat Directive[30] do not enter force directly in Germany and must, as a result, be properly transposed in the new Federal Nature Conservation Act. The draft does not keep pace with this, especially in comparison with the particular procedural provisions laid down in the Flora Fauna Habitat Directive.

With specific regard to the introduction of wild birds, art. 11 of the Bird Conservation Directive stipulates: "Member States shall see that any introduction of species of bird which do not occur naturally in the wild state in the European territory of the Member States does not prejudice the local flora or fauna. In this connection they shall consult the Commission."

A similar stipulation is contained in art. 22 of the Flora Fauna Habitat Directive, this time with regard to the introduction of additional animal species and also plants: "In implementing the provisions of this Directive, Member States shall: a) study the desirability of re-introducing species in Annex IV that are native to their territory where this might contribute to their conservation, provided that an investigation, also taking into account experience in other Member States or elsewhere, has established that such re-introduction contributes effectively to re-establishing these species at a favourable conservation status and that it takes place only after proper consultation of the public concerned; b) ensure that the deliberate introduction into the wild of any species which is not native to their territory is regulated so as not to prejudice natural habitats within their natural range or the wild native fauna and flora and, if they consider it necessary, prohibit such introduction. The results of the assessment undertaken shall be forwarded to the committee for information; ..."

## Licensing practice

This outline of licensing practice is based on our survey of higher to top-tier authorities responsible for hunting, fishery and forestry in the federal states of Niedersachsen,

[28]The EC CITES Regulation is to be replaced on 01/06/1997 by the new EC Regulation on the Protection of Species (Text in Common Position (EC) no. 26/96 adopted by the Council on 26 February 1996 with regard to issuing Council Regulation (EC) no. 338/97 of 9 December 1996 on protecting specimens of wild animal and plant species by monitoring trade, OJ C 196/58).

[29]Council Directive of 2 April 1979 on the Conservation of Wild Birds, OJ L 103/1.

[30]Council Directive 92/43/EEC of 21 May 1992 on the Preservation of Natural Habitats and of Wild Fauna and Flora.

Nordrhein-Westfalen, Baden-Württemberg and Hessen. The findings can be summarised as follows:

Urban population centres reported the same problems as more rural districts with regard to the typical problems associated with the release and spread of garden and ornamental plants and domestic pets.

A distinction between deliberate and negligent release is rarely drawn in practice, as the procedure is usually only confronted with the result, the occurrence of an alien species, and it is difficult to ascertain as a rule how this species actually entered the wild. It is not easy for the authorities to establish, for example, whether the tortoises they discover ran away from their owners or whether their owners had been trying to get rid of them. The problem is similar with plants.

As far as *animals* are concerned, most cases of release related to alien fish or amphibians. Top of the list were various species of tortoise or turtle. A number of authorities identified the appearance of alien birds. Among the mammals, the most frequent reports were of alien species of game. The picture for *plants* shows that most of the species named were garden plants.

As a general rule the authorities surveyed did not react to reported releases of non-native organisms by imposing penalties or ordering the perpetrators to remove the offending organism, the main reason being that they were unable to ascertain the perpetrator's identity. Only one instance was reported in which the offender was ordered to eliminate the deed and placed under prohibition.

Applications for licences to release alien animals and plants are only received in comparatively modest quantities (e.g. 20 applications in those four federal states over the last ten years). There is also a definite north-south divide. Most of the applications (11) were lodged in Baden-Württemberg. Most applications are made with the aim of re-introducing formerly native species of game (6) or for research purposes (4). At the same time, however, no mention was made of any legal dispute over the issue of a licence, nor of any claims for compensation due to the release of alien species.

In processing applications to release alien species, the authorities rely as a rule on internal knowledge, including consultation with other specialist authorities, and on scientific material which is universally accessible. The authorities do not either carry out preparatory experiments themselves or ask the applicant to do this (if the latter have not already carried out such experiments already as part of their scientific research, e.g. for university projects). None of the authorities surveyed had any table or scheme for evaluating the species or the potential dangers beyond the text of the law. Where uncertainty prevails, this (more or less overtly) weighs against the applicant.

## Comparison with the release of genetically modified organisms

As both non-native and genetically modified organisms (GMO) introduce new genetic material into native populations licensing procedures and risk assessment methods as developed for releasing genetically modified organisms may be consulted.

As far as the wording of the law is concerned, if we compare the risk assessment applied under the Federal Nature Conservation Act to the release of alien species with that applied by the Genetic Engineering Act to the release of GMOs, the former proves more restrictive. Harmful consequences may not be compensated by any advantages to be gained from release, which they may under § 16 para. 1 of the Genetic Engineer-

ing Act. Nor does the applicant have any entitlement in the licensing procedure, which is at the discretion of the authority. The burden of proof lies with the applicant, who also bears the burden of doubt. It should be borne in mind, however, that the narrow interpretation of constituent facts (especially the "wild" element) pursuant to the Nature Conservation Act means that there are relatively few instances of the release of alien species into the environment which require licensing.

The history of neophyte proliferation shows that the period which elapses between release and proliferation can be expected to be of the magnitude of decades to centuries. Due to the effects of time lag, new species will continue to spread in future with sometimes unexpected consequences, even if no further new species are added (Kowarik 1996). This means that "the danger ... that the native community of flora and fauna will be contaminated" has already materialised (Böcker *et al.* 1995, Doyle 1996, Gebhardt *et al.* 1996). It would be desirable, in order to keep the further proliferation of alien species to a minimum, at least to make sufficient use of the scope offered by existing legislation.

Nevertheless, any impression that the release of alien species is subject to stricter regulation will be corrected by comparing licensing practice for the release of alien species with that for the release of GMOs (compare Fisahn 1998). The salient difference between the two procedures relates to the effort invested around risk assessment. For the release of alien species, risk assessment involves a not particularly elaborate method which draws on a relatively limited, certain base of empirical and theoretical knowledge about how native and non-native species relate. This risk assessment is made easier by the unambiguous allocation of the burden of proof, which is borne by the applicant. Licences for the release of GMOs, on the other hand, are founded on far more extensive scientific research into the properties of the GMO and its potential environmental impact. Given the reference to current scientific understanding, it is hardly likely that any decision will rest on a burden of proof. The difference can be illustrated in quantitative terms, too. Whereas the report and decision of the licensing authority in the case of alien species covered two pages at most, in the case of GMOs this documentation has easily amounted (so far, anyway) to fifty or a hundred pages. This indicates that the supervision of GMO release is more precise than for species release.

This cannot be explained in terms of the substantive provisions of the law, as the conditions for species release are more restrictive, as we have seen. One factor towards an explanation is the social context. The public regards GMO release as a problem, whereas little concern is shown about problems arising from the release of alien species. Secondly, the way the procedure is organised evidently leads to different intensities of investigation. Responsibility for GMO licensing rests in Germany with the Robert Koch Institute, a centralised authority with a considerable staff of experts, whereas species licensing is usually "only" the task of the higher-level nature conservation authorities, who see it as one job among many. Finally, GMO licensing entails a certain public participation, if limited, whereas species licensing does not involve the public at all, with not even specialist organisations being consulted.

For the foreseeable future, however, we can probably expect little more than modest steps towards a more differentiated regulatory regime for alien organisms. This includes a need for Germany, like others, to devise methods of risk assessment. These could be designed to deal variously with, in particular, the above-mentioned differences between natural, cultivated and genetically modified properties, perhaps by making

more allowance for the risks incurred by re-introducing formerly native organisms than for those induced by the first introduction of organisms with artificially modified characteristics or organisms drawn from other habitats.

**Recommendations**

For a better success in practice of stopping unwanted releases of non-native plants and animals the following recommendations are suggested.

Field of application:
It would be advisable to formulate the elements of prohibition separately from the elements of permission. This would make it possible to state more clearly that negligent release constitutes an offence. According to the general definition of terms, no licence is required for introducing alien animals and plants in settlement areas or in artificially cultivated spaces. Given the real risks, this does not serve the purpose of the law.

The distinction between first introduction and re-introduction:
A differentiated approach is advisable. This need can also be derived from the international standards and EC law (Convention on the Protection of Biological Diversity, Alpine Convention, Flora Fauna Habitat Directive). With regard to the release of alien species which have never been native to Germany, it is worth considering whether it would not be appropriate to ask for proof of benefits, e. g. as in art. 17 clause 2 of the Alpine Protocol.

Imports:
The power granted in the new EC Diversity Regulation to control imports in order to protect nature and landscapes from non-native species seems to have been established at the wrong level. The draft amendment to the Federal Nature Conservation Act compensates by allowing for the introduction of a ban on possession by means of a legal ordinance.

The privileged status of agriculture and forestry:
The privilege which agriculture and forestry enjoy does not serve the purpose of the law. The relevant legal provisions do not adequately cover the dangers and risks associated with the release of alien species of plants.

Animal protection regulations:
The amendment to the Federal Nature Conservation Act removes any duty to license the setting free of alien animals. This means that aspects of nature conservation need to be incorporated in the Animal Protection Act.

Unintended release:
A federal framework regulation should be adopted, analogous to the provisions in various Nature Conservation Acts passed by the *Länder*, requiring a licence to open and operate establishments in which alien species of flora and fauna are kept. The safety standards should be stipulated in non-statutory regulations.

Monitoring:
To ensure appropriate enforcement, Germany would have first of all to ascertain whether federal and state provisions grant the authorities enough powers to monitor developments. An explicit regulation would make the competence of the monitoring authorities clear.

International co-operation:
The relevant EC provisions do prescribe some duties to report and consult. These must be taken into account. The Federal Nature Conservation Act does not make such provision. Consultation would above all be necessary and meaningful when release might have cross-border consequences.

## Acknowledgement

The investigations were conducted and funded within the framework of the Environmental Research Plan of the Federal Ministry of the Environment under project number 108 02 901/02.

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