

NEW NUCLEAR SOURCE AT THE DUKOVANY SITE

Supplementation of explaining documents to the part of the statement set up within Joint opinion of Austrian Legal Representations for Environment and Nature Conservation

January 2019

Statement form:

The need of improvement follows from the result assessment of evaluating the ionising radiation impact on zoology and botany. The zoology representatives are under review in the document that are specified as reference organisms in the IAEA Safety Standards, Draft Safety Guide DS 427.

Reducing costs of the applicant is the primary objective of this document as stated repeatedly. However, the process must be critically reviewed and justified within EIA as minimum. Taking into the account document "ICRP, Environmental Protection: the Concept and Use of Reference Animals and Plants, ICRP Publication 108, Elsevier (2008)" that is the basis for this document, it is clear that the selected estimate must be insufficient. Therefore, higher radioisotope enrichment in organisms at food chain upper level and stronger impact on organisms with small population and low reproduction rate should be expected. The presence of white-tailed eagle (*Haliaeetus albicilla*), most probably even sitting on eggs must be taken into consideration with regard to National Park Thayatal above all, the same applies to the otter (*Lutra lutra*) and fox (*Vulpes vulpes*). Concerning deer as a reference organism, attention is drawn to the usually higher stress of roe (*Capreolus capreolus*) and wild boars (*Sus scrofa*) due to ingestion. The presence of the wildcat (*Felis silvestris*) may be also recognized as a speciality due to the necessity to consider it as a particularly sensitive species because of the small number of individuals and the reproduction potential with domestic cats (*Felis silvestris catus*) running freely about. Nevertheless, if scientific reasons for unchanged use of reference animals still exist, they should be documented.

The specified newest studies of tritium impacts on fresh water fish should be quoted, so that the declarations, specified in the submitted document could be evaluated. Finally, other national parks and protected areas located in the vicinity should be also referred to in addition to National Park Dyje Valley (Thayatal) for the sake of completeness. As a minimum, the occurrence of particularly sensitive species should be examined here.

The reaction to the comment consists of two steps:

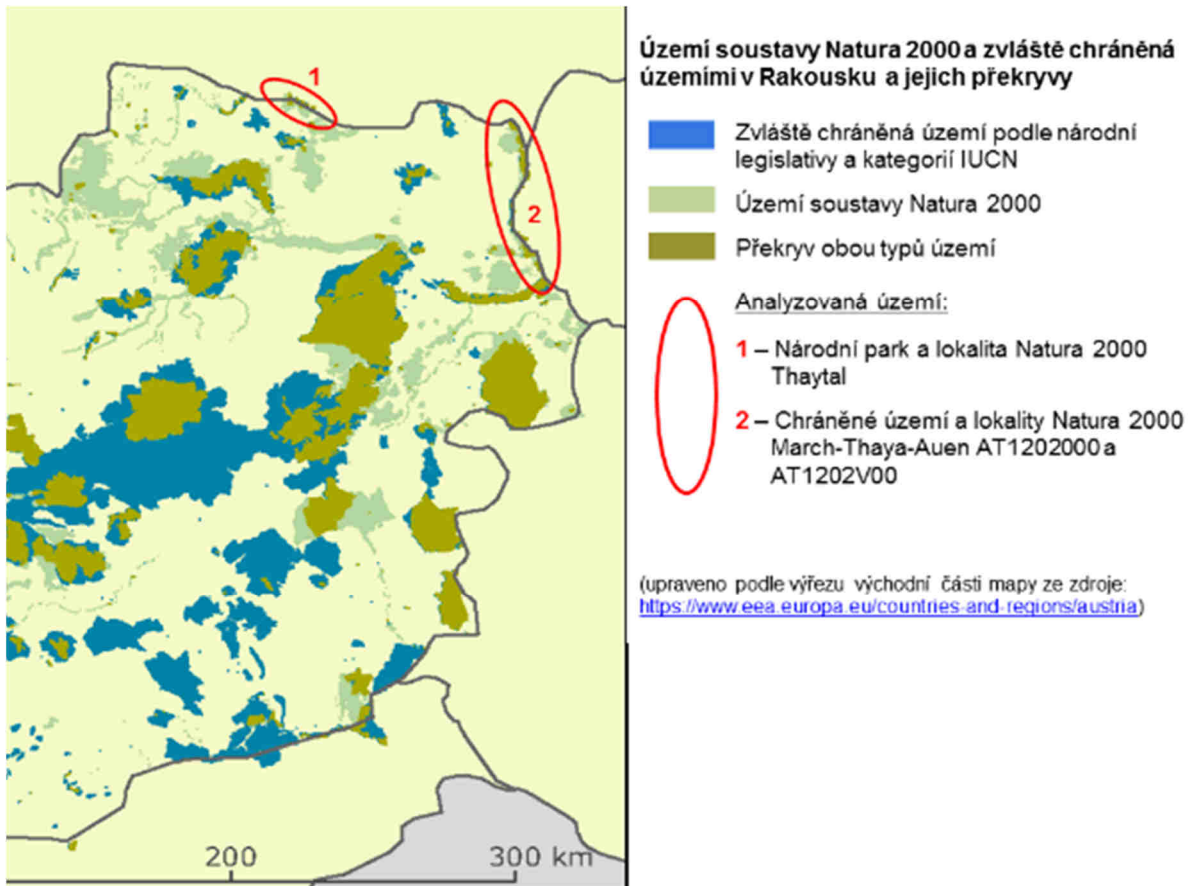
1. The existence and extent of specially protected areas and areas of Natura 2000 system mentioned in the comment have been verified, as well as the protection subjects of these areas
2. In relation to possible impacts on the identified areas and organisms, specified in the comment, possible radiation impacts were evaluated according to the conclusions of the Summary Report on Radiation Effects of NNS - Operating Conditions - Summary Study - Annex 5.1 of the EIA documentation (https://portal.cenia.cz/eiasea/detail/EIA_MZP469).

Settling the above mentioned comment is complemented by the presence of national parks and areas of Natura 2000 system in Austria that are mentioned in the comment and that could be affected potentially by the NNS operation.

Concerning the scientific aspect, the raised comment is not formulated precisely and expertly enough, as it does not differentiate between areas and target species that might be affected by entirely different forms of radiation load. The radiation load from the NNS operation has two entirely different routes of radionuclide emissions. Namely, effluents to atmosphere and effluents to receiving waters. These two forms of effluents must be dealt with separately, because not only characteristics and vectors of possible radioactivity transmission are entirely different, but they also interfere with different ecosystems and their components (species).

Areas of Interest of the Nature Conservation in the Austrian Republic

Summary of specially protected areas and areas of Natura 2000 system in Austria



Území soustavy Natura 2000 a zvláště chráněná území v Rakousku a jejich překryvy	Areas of Natura 2000 system and specially protected areas in Austria and their overlaps
Zvláště chráněná území podle národní legislativy a kategorií IUCN	Specially protected areas according to the national legislation and IUCN categories
Území soustavy Natura 2000	Areas of Natura 2000 system
Překryv obou typů území	Overlap of both area types
Analyzovaná území	Analysed areas
Národní park a lokalita Natura 2000 Thaytal	National park and Natura 2000 site Thaytal
Chráněné území a lokality Natura 2000 March-Thaya-Auen AT1202000 a AT 12D2V00	Protected areas and Natura 2000 sites March-Thaya-Auen AT1202000 and AT 12D2V00
upraveno podle výřezu východní části mapy ze zdroje	modified according to the cut out of eastern part of the map from the source

1. NP Thayatal and area of Natura 2000 system FFH-Gebiet Thayatal bei Hardegg (AT1208A00)

The area of the NP Thayatal (as well as of the NP Podyjí on the side of the Czech Republic) cannot be exposed to impacts of radionuclides, spreading from effluents into receiving waters, because no water course flows into this part of Dyje river from the vicinity of NNS that could transport radionuclides.

It means that radiation impacts must be evaluated for the areas of NP Podyjí on the Czech side and NP Thayatal on the Austrian side only based on the model of radionuclide depositions from effluents in atmosphere transported by air. The model area of both national parks Podyjí/Thayatal covers the sectors 118 and 130 (distance 30 – 50 km) in calculation areas.

The Austrian NP Thayatal has an area of 13.3 km² only. The area of Natura 2000 system, part of which is the national park, has an area of 44.28 km² according to the standard data form (<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=AT1208A00>).

The NP Podyjí on the Czech side has an area of 62.76 km² plus the protection zone of 28.22 km². The special protection area of birds Podyjí having an area of 76.657 km² is included in the Natura 2000 system as well.

Possible influence on the wildcat population is mentioned in the comment (*Felis silvestris*). This species lives an extremely hidden life and it was exterminated in large parts of Europe in the past. Observations in the area of NP Podyjí/Thayatal are scarce only and not confirmed by systematic survey. Therefore, the wildcat is not listed among protection subjects either in the Natura 2000 system area FFH-Gebiet Thayatal bei Hardegg (AT1208A00) or in the NP Thayatal.

The administration of the Austrian NP Thayatal prepared a web application (in German, Czech, and English languages) that collects documents on occurrence of this species <http://www.wildkatze-in-oesterreich.at/cz/pages/kocka-divoka.aspx>. Several observations were made thanks to this application indicating that wildcat individuals could occur in the NP Thayatal. However, this is definitely no stable population proved by scientifically based survey and monitoring.

The nearest wildcat population is situated in southern foothills of Slovak Carpathian Mountains overlapping to highland areas of Hungary and in small isolated areas of northern Austria. This is documented by the map shown at the above mentioned web site. However, this map is not quite precise, as it includes also the high mountain chains of Carpathian Mountains in Slovakia, Ukraine and Austria in the displayed natural range. However, the wildcat avoids higher altitudes, because its ability to hunt in high snow cover is limited. Wildcats prefer hardwood forests from lower to middle altitudes. Thus, the area of NP Podyjí/Thayatal is a very suitable territory for the cat in perspective with regard to biotope, but no separate population has been confirmed here yet.

Neither the fox nor the boar meet the mentioned criterion of “small population”. Both species are very numerous both in the territory of the Czech Republic and in the territory of Austria. Their populations are even so large in recent years that they begin to create problems of the nature of veterinary and humane zoonosis transmission risks in the territory of both states.

The loading for the European river otter and the white-tailed eagle, that are part of the food chain of water courses and reservoirs, will be minimal in this area, because water courses are not loaded by radioisotopes from effluents into receiving waters in wide neighbourhood of the Thayatal area.

Subjects of protection – habitats in the area of Natura 2000 system “FFH-Gebiet Thayatal bei Hardegg” (AT1208A00) (an analogy to the site of significant importance in the Czech Republic)

(Prepared according to the standard data form for the area FFH-Gebiet Thayatal bei Hardegg (AT1208A00), <http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=AT1208A00>)

3130 Oligotrophic to mesotrophic standing waters of plain to subalpine level of continental and alpine zone

3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition type vegetation

3260 Water courses of plain to mountain levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation

4030 European dry heaths

6110* Calcareous or basophilic grasslands (Alyso-Sedion albi)

6190 Rupicolous pannonic grasslands (Stipo-Festucetalia pallentis)

6210* Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia), notable places of occurrence of the orchid family

6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)

6430 Hydrophilous tall herb fringe communities of plains and of the mountain to alpine levels

6510 Extensively managed hay meadows of the planar to submontane zones (Arrhenatherion, Brachypodio-Centaureion nemoralis)

8220 Siliceous rocky slopes with chasmophytic vegetation

8230 Siliceous rock with pioneer vegetation (Sedo-Scleranthion, Sedo albi-Veronicion dillenii)

8310 Caves with no public access

9110 Beech forests of Luzulo-Fagetum association

9130 Beech forests of Asperulo-Fagetum association

9150 Medio-European limestone beech forests (Cephalanthero-Fagion)

9170 Galio-Carpinetum oak-hornbeam forests

9180* Tilio-Acerion forests of slopes, screes and ravines

91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* of temperate and boreal Europe (Alno-Padion, Alnion incanae, Salicion albae)

91M0 Thermophilic Pannonic-Balkan oakwoods of Turkey oak and sessile oak (do not occur in the Czech Republic)

- Vertebrates

- mammals

- Geoffroy's bat (*Myotis emarginatus*)
- western barbastelle (*Barbastella barbastellus*)
- Bechstein's bat (*Myotis bechsteini*)
- greater mouse-eared bat (*Myotis myotis*)
- lesser horseshoe bat (*Rhinolophus hipposideros*)
- Eurasian otter (*Lutra lutra*)

- amphibians

- Northern crested newt (*Triturus cristatus*)
- European fire-bellied toad (*Bombina bombina*)

- fish

- European bullhead (*Cottus gobio*)

- Invertebrates

- Butterflies

- eastern eggar (*Eriogaster catax*)
- scarce fritillary (*Euphydryas maturna*)
- dusky large blue (*Phengaris nausithous*)
- scarce large blue (*Phengaris teleius*)
- large copper (*Lycaena dispar*)
- Jersey tiger (*Euplagia quadripunctaria*)

- beetles

- stag beetle (*Lucanus cervus*)

- molluscs

- thick shelled river mussel (*Unio crassus*)
- narrow-mouthed whorl snail (*Vertigo angustior*)

- Higher plants

- greater pasque flower (*Pulsatilla grandis*)

Subjects of protection in the National Park “Thayatal National Park”

These subjects of protection do not depend on above mentioned protection subjects of the site of Natura 2000 system “FFH-Gebiet Thayatal bei Hardegg” but they were selected based on the national legislation of the Austrian Republic.

Taken over from the source http://www.natura.org/sites_at_thayatal.html,

Habitat:

- 3260 Water courses of plain to mountain levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation
- 4030 European dry heaths
- 6110* Calcareous or basophilic grasslands (Alyso-Sedion albi)
- 6210* Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia), notable places of occurrence of the orchid family
- 6240* Sub-pannonic steppic grasslands
- 6510 Extensively managed hay meadows of the planar to submontane zones (Arrhenatherion, Brachypodio-Centaureion nemoralis)
- 8220 Siliceous rocky slopes with chasmophytic vegetation
- 9110 Beech forests of Luzulo-Fagetum association
- 9130 Beech forests of Asperulo-Fagetum association
- 9150 Medio-European limestone beech forests (Cephalanthero-Fagion)
- 9170 Galio-Carpinetum oak-hornbeam forests
- 9180* Tilio-Acerion forests of slopes, screes and ravines

Zoology:

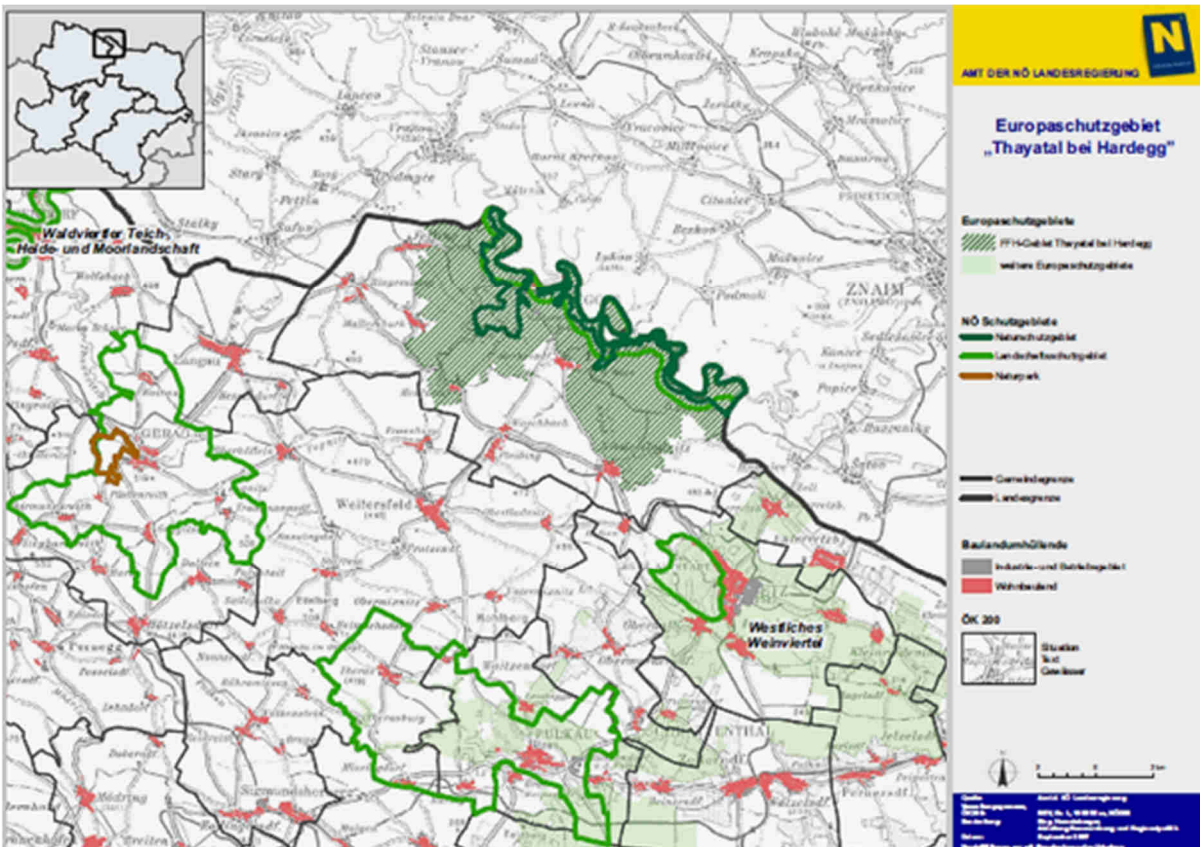
- Vertebrates
 - mammals
 - Geoffroy’s bat (*Myotis emarginatus*)
 - Eurasian otter (*Lutra lutra*)
 - birds
 - black stork (*Ciconia nigra*)
 - Eurasian hoopoe (*Upupa epops*)
 - Eurasian wryneck (*Jynx torquilla*)
 - common kingfisher (*Alcedo atthis*)
 - white-tailed eagle (*Haliaeetus albicilla*)
 - reptiles
 - amphibians
 - Northern crested newt (*Triturus cristatus*)
 - European tree frog (*Hyla arborea*)
 - pool frog (*Rana lessonae*)
 - agile frog (*Rana dalmatina*)
 - fish
 - spined loach (*Cobitis taenia*)
 - European bullhead (*Cottus gobio*)
- Invertebrates
 - butterflies
 - clouded Apollo (*Parnassius mnemosyne*)
 - giant peacock moth (*Saturnia pyri*)
 - Old World swallowtail (*Papilio machaon*)

- southern festoon (*Zerynthia Polyxena*)
- Jersey tiger (*Panaxia quadripunctaria*)

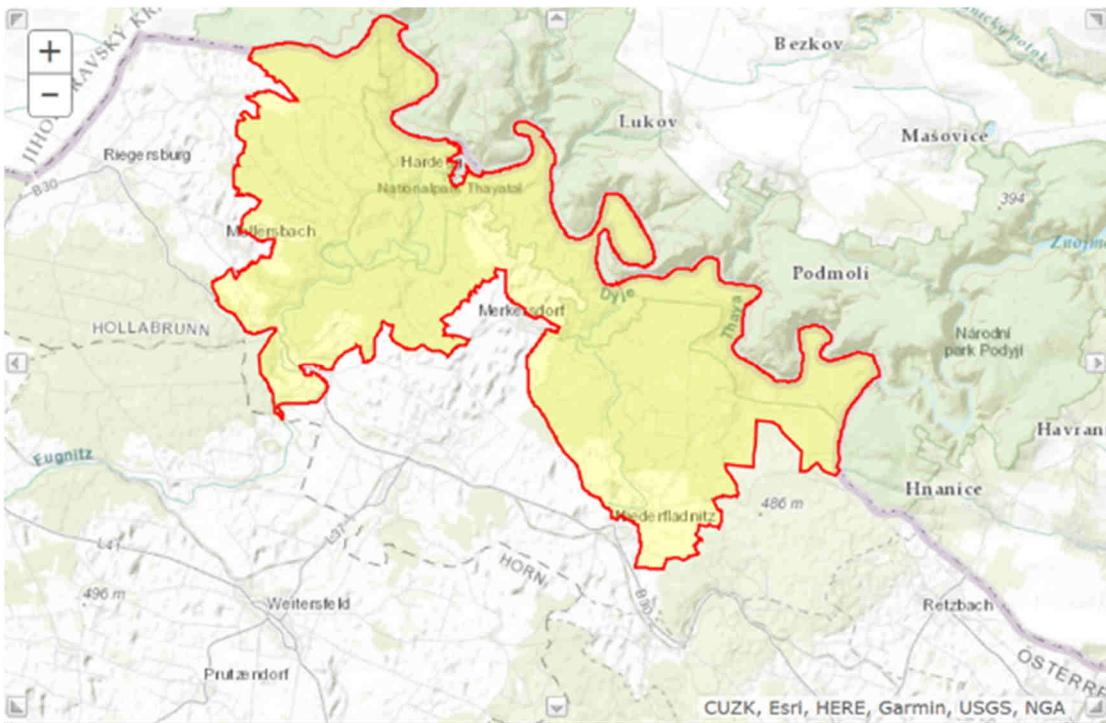
Higher plants:

- needle grass (*Stipa dasyphylla*)
- Hungarian iris (*Iris variegata*)
- black false hellebore (*Veratrum nigrum*)
- yellow monkshood (*Aconitum anthora*)
- sedge (*Carex pediformis*)
- Siberian melic grass (*Melica altissima*)
- lady's-slipper orchid (*Cypripedium calceolus*)
- gas plant (*Dictamnus albus*)
- purple small-reed (*Calamagrostis canescens*)
- night-scented stock (*Hesperis tristis*)

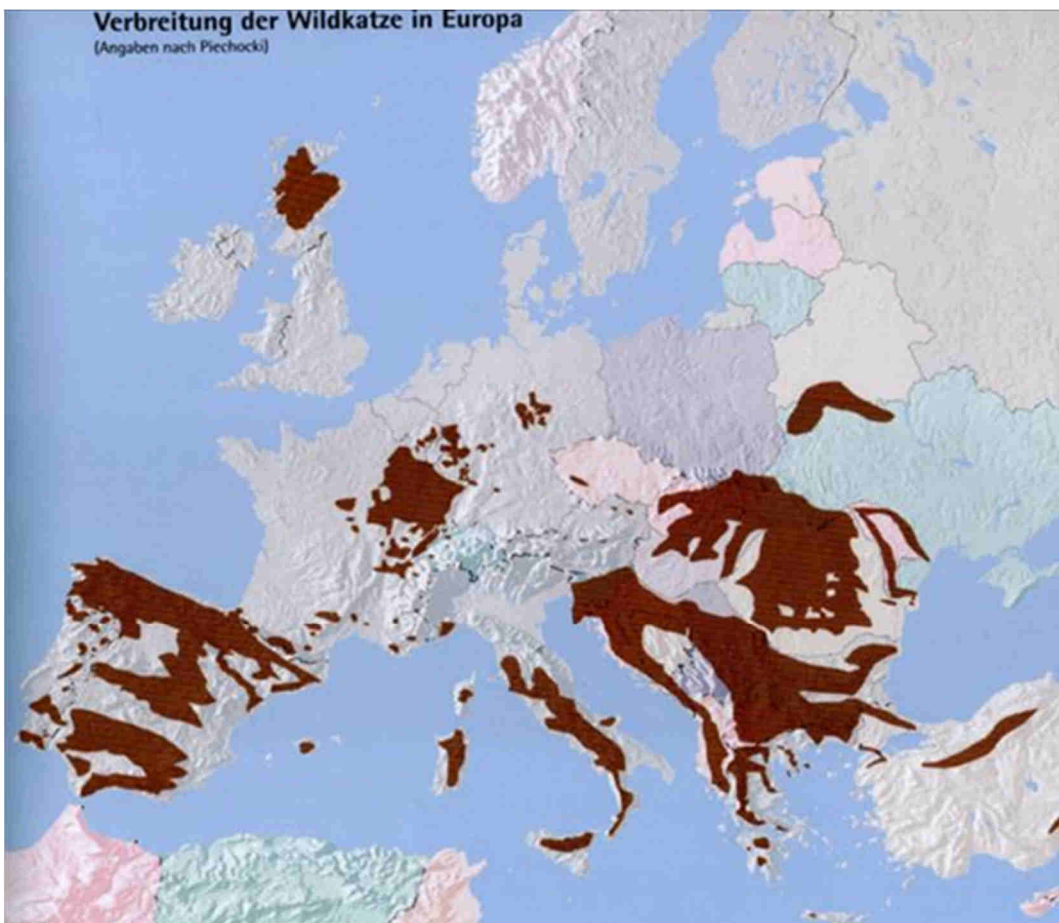
General map of the overlap of Natura 2000 system area “FFH-Gebiet Thayatal bei Hardegg” (AT1208A00) and NP Thayatal



Map of the area of Natura 2000 system "FFH-Gebiet Thayatal bei Hardegg" (AT1208A00)



Current spread of the wildcat (*Felis silvestris*) in Europe



2. Natura 2000 system area - FFH-Gebiet March-Thaya-Auen AT1202000 (analogy to the site of significant importance in the Czech Republic) and European bird protection area March-Thaya-Auen AT1202V00 (analogy to the birds area in the Czech Republic)

This area is situated within the distance of 70 – 100 km south-east from NNS and consists of the Morava River floodplain from the confluence with Dyje to its stream mouth into Danube. The area of March-Thaya-Auen is, in addition to the incorporation into the European Natura 2000 system in Austria (overlapping also to the Czech Republic and Slovakia), protected as Ramsar Wetlands at the same time. There is a number of small-scale specially protected areas in the territory of all three states and the border water course is part of the Protected Landscape Area Záhorie in the Slovak territory.

The radiation impacts can be evaluated by no other than model based method with regard to the distance of the area of NP Podyjí on the Czech side and NP Thayatal on the Austrian side from the point of radioactive substances effluent from NNS to environment.

The model of radionuclide depositions from effluents in atmosphere transported by air is for the area Thaya – March – Auen in the sector No. 84 (70 – 100 km).

While air spread radionuclides are deposited following the predominant wind direction, radionuclides transported by water advance in water courses and may sediment for different time periods both in water courses and, above all, in standing or slowly flowing water where the sedimentation is considerably higher even of small particles. Each reservoir, even large one (Mohelno water reservoir, system of reservoirs Nové Mlýny), can deposit radionuclides into sediments for many years. Sediments in stream parts of river may accumulate for months even years, but large drift of all particles (including radionuclides) further downstream occurs always during periods of large flow rates (at snow thawing, strong rains in vegetation season). Existence of the three large-scale reservoirs on Dyje near Nové Mlýny represents then really large trap for sediments that will be stopped in the reservoirs for many years even decades, until they are transported further downstream Jihlava down to Dyje river and eventually Morava and Danube. Water volumes that are the vector of radionuclides transmission are diluted significantly at that. To have an idea, I present long-term average flow rates at the monitored route:

Jihlava – Mohelno monitoring point $5.35 \text{ m}^3\text{s}^{-1}$

Dyje – Ladná Jihlava – Mohelno monitoring point $36 \text{ m}^3\text{s}^{-1}$

The specified values show that the average flow rate in Dyje upstream Břeclav is 6.7 times higher and the dilution value of potentially wafted substances also corresponds to this, should they all be transported up to this monitoring point. A large complex of areas protected according to the national legislation of the Czech Republic, Slovak Republic and Austrian Republic begins downstream Břeclav. Dyje falls after approximately 32 km of water course from the last measured monitoring point at Dyje (in Ladná) into Morava that has average annual flow rate of $61.1 \text{ m}^3\text{s}^{-1}$ in the last measured monitoring point upstream the confluence with Dyje in Lanžhot. Several smaller water courses (Kyjovka, Včelínek) fall to both rivers in addition prior to leaving the Czech Republic. It means that Morava River has average flow rate of $98 \text{ m}^3\text{s}^{-1}$ in the Slovakian – Austrian borderland and the dilution (compared to the monitoring point Mohelno as the potential source of substances with highest concentration) reaches values approaching the value of 1:20.

Since the values of loading water course and model organisms meet the parameters of IAEA Safety Standards, Draft Safety Guide DS 427 with large margin already in Jihlava downstream the Mohelno water reservoir, the load of model organisms in the area March-Thaya-Auen will be at least 20 times lower. However, the actual load in the Austrian territory will be even many times lower due to the slow transfer by Dyje, including partial or temporary sedimentation of radionuclides in the system of Nové Mlýny reservoirs.

With regard to the fact that models proved radiation safety of the NNS operation for water and water tied organisms already in Jihlava River downstream the Mohelno water reservoir where it reaches tenths or even hundredth of normed values safe load for reference organisms according to the IAEA Safety Standards, Draft Safety Guide DS 427, then these loads will be by at least one order lower in the area March-Thaya-Auen.

Protection subjects – habitats in the area of Natura 2000 system - FFH-Gebiet March-Thaya-Auen AT1202000 (analogy to site of significant Importance in the Czech Republic)

- 1530* Pannonic salt steppes and salt marshes (*do not occur in the Czech Republic*)
2340* Pannonic inland dunes (*do not occur in the Czech Republic*)
3130 Oligotrophic to mesotrophic standing waters of plain to subalpine level
3150 Natural eutrophic lakes
3270 Rivers with muddy banks with vegetation
6240* Sub-pannonic steppic grasslands
6250* Pannonic loess steppic grasslands
6440 Alluvial meadows of river valleys
6510 Extensively managed hay meadows of the planar to submontane zones
9160 Sub-Atlantic and Central European oak and oak-hornbeam forests
91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*
91F0 Riparian mixed forests of *Quercus robur*
91G0* Pannonic oak-hornbeam forests

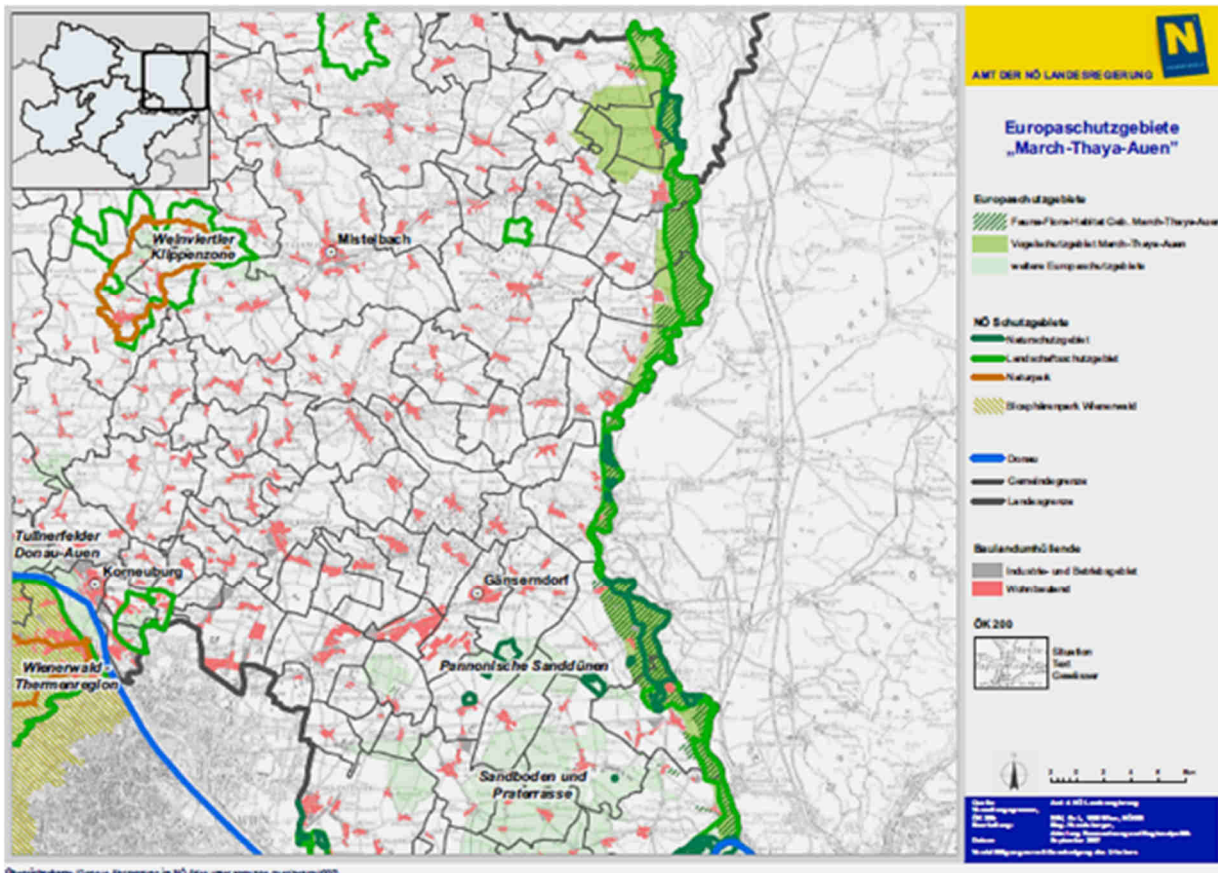
* *priority habitat*

- vertebrates
 - mammals
 - Eurasian beaver (*Castor fiber*)
 - greater mouse-eared bat (*Myotis myotis*)
 - European ground squirrel (*Spermophilus citellus*)
 - Eurasian otter (*Lutra lutra*)
 - amphibians
 - Danube crested newt (*Triturus dobrogicus*)
 - European fire-bellied toad (*Bombina bombina*)
 - reptiles
 - European pond turtle (*Emys orbicularis*)
 - cyclostomes and fish
 - Mesopotamian asp (*Leuciscus aspius*)
 - Danube streber (*Zingel streber*)
 - common zingel (*Zingel zingel*)
 - European bitterling (*Rhodeus amarus*)
 - gudgeon (*Gobio gobio*)
 - schraetzer (*Gymnocephalus schraetser*)
 - European weatherfish (*Misgurnus fossilis*)
 - pigo (*Rutilus pigus*)
 - spined loach (*Cobitis taenia*)
- Invertebrates
 - beetles
 - flat bark beetle (*Cucujus cinnaberinus*)
 - stag beetle (*Lucanus cervus*)
 - Great Capricorn beetle (*Cerambyx cerdo*)
 - butterflies
 - eastern eggar (*Eriogaster catax*)
 - dusky large blue (*Phengaris nausithous*)
 - scarce large blue (*Phengaris teleius*)
 - large copper (*Lycaena dispar*)
 - Dragonflies
 - green snaketail (*Ophiogomphus cecilia*)
 - molluscs
 - thick shelled river mussel (*Unio crassus*)

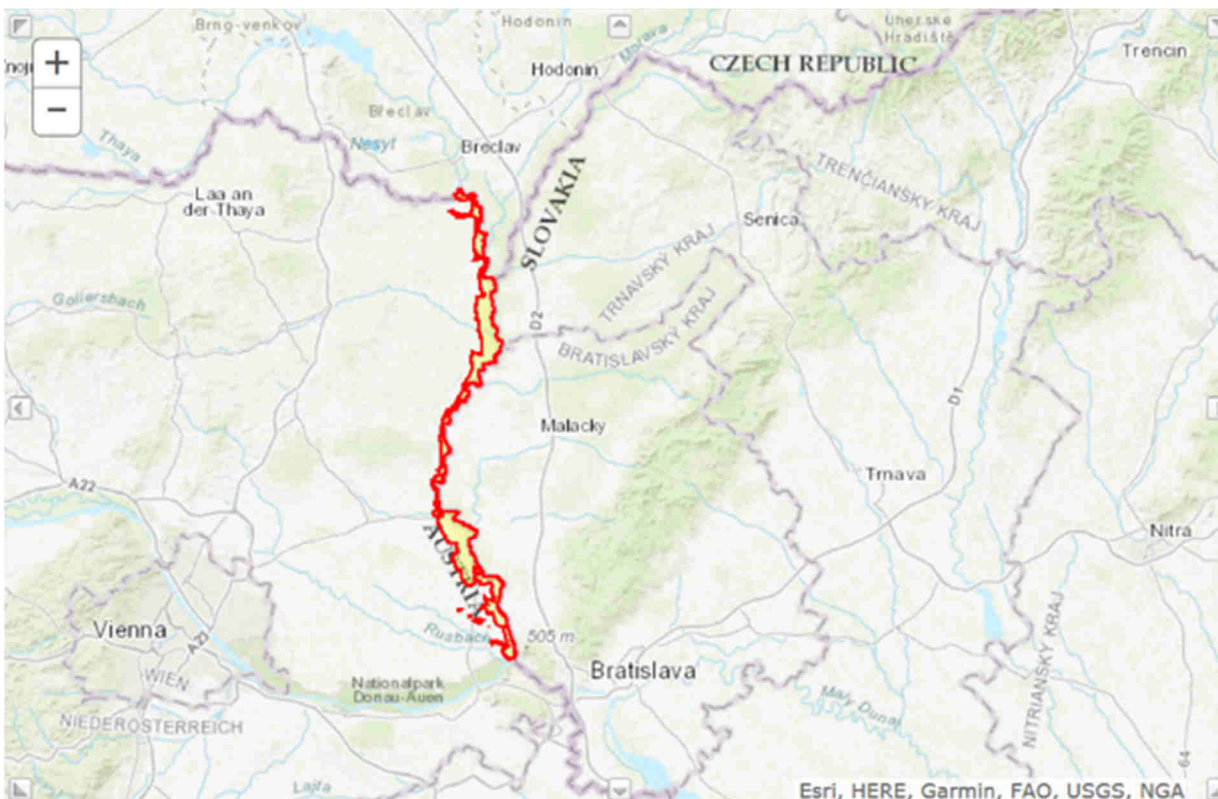
Protection subjects – species in the area of Natura 2000 system European bird protection area AT1202V00 (analogy to the birds area in the Czech Republic)

Eurasian bittern (*Botaurus stellaris*)
little bittern (*Ixobrychus minutus*)
white stork (*Ciconia ciconia*)
black stork (*Ciconia nigra*)
black woodpecker (*Dryocopus martius*)
merlin (*Falco columbarius*)
spotted crake (*Porzana porzana*)
little crake (*Porzana parva*)
corn crake (*Crex crex*)
common crane (*Grus grus*)
ruff (*Philomachus pugnax*)
short-eared owl (*Asio flammeus*)
Eurasian spoonbill (*Platalea leucorodia*)
European golden plover (*Pluvialis apricaria*)
Black-crowned night heron (*Nycticorax nycticorax*)
common kingfisher (*Alcedo atthis*)
collared flycatcher (*Ficedula albicollis*)
European nightjar (*Caprimulgus europaeus*)
tawny pipit (*Anthus campestris*)
red kite (*Milvus milvus*)
black kite (*Milvus migrans*)
smew (*Mergellus albellus*)
Montagu's harrier (*Circus pygargus*)
hen harrier (*Circus cyaneus*)
western marsh harrier (*Circus aeruginosus*)
eastern imperial eagle (*Aquila heliaca*)
lesser spotted eagle (*Aquila pomarina*)
white-tailed eagle (*Haliaeetus albicilla*)
osprey (*Pandion haliaetus*)
barred warbler (*Sylvia nisoria*)
black-winged stilt (*Himantopus himantopus*)
ferruginous duck (*Aythya nyroca*)
whiskered tern (*Chlidonias hybridus*)
black tern (*Chlidonias niger*)
common tern (*Sterna hirundo*)
Caspian tern (*Sterna caspia*)
wood lark (*Lullula arborea*)
bluethroat (*Luscinia svecica*)
peregrine falcon (*Falco peregrinus*)
Syrian woodpecker (*Dendrocopos syriacus*)
middle spotted woodpecker (*Dendrocoptes medius*)
red-backed shrike (*Lanius collurio*)
European honey buzzard (*Pernis aviporus*)
wood sandpiper (*Tringa glareola*)
great egret (*Ardea alba*)
purple heron (*Ardea purpurea*)
little egret (*Egretta garzetta*)
Eurasian eagle-owl (*Bubo bubo*)
grey-headed woodpecker (*Picus canus*)

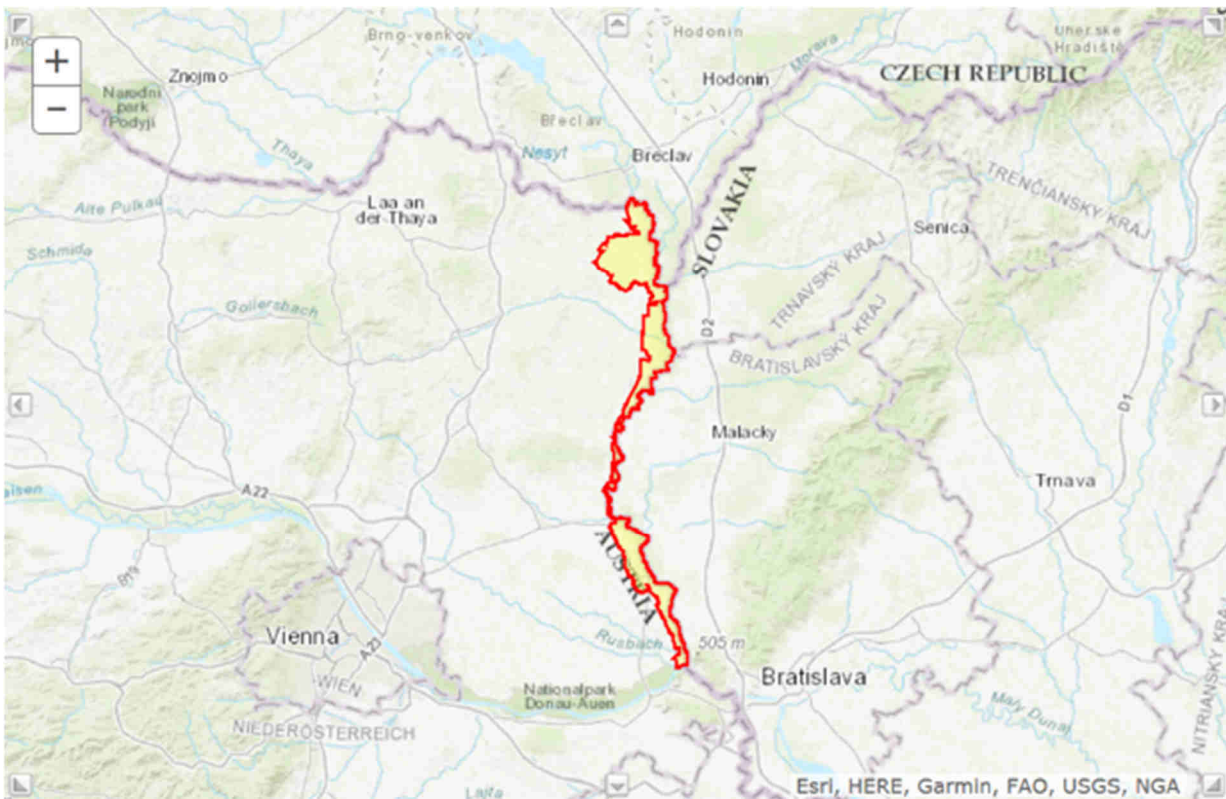
Area of Natura 2000 system - FFH-Gebiet March-Thaya-Auen AT1202000 and European birds protection area March-Thaya-Auen AT1202V00 overlapping with specially protected areas according to the Austrian legislation



Detail of the area of Natura 2000 system - FFH-Gebiet March-Thaya-Auen AT1202000



Detail of the Natura 2000 Europäischen Vogelschutzgebiet March-Thaya-Auen AT1202V00



Addendum to evaluation of radiation impacts

The calculated radiation loading on reference animals and plants is many digit places under the derived reference levels in all analysed cases of annual operating effluents from NNS. Calculations of radiation load of the population of reference organisms were performed using the program ESTE Annual Impacts according to the ICRP 108 and ICRP 114 methodology. If reference levels are reached, it would be justified that specific study and specific monitoring of specific groups of organisms were performed in order to determine the transient and accumulation factors more precisely, eventually to determine the habits of individual organisms.

Individual areas of interest for calculating impacts on biosphere are shown at the figure below. Sectors 130 and 118 cover the area of National Park Podyjí, the sector 106 represents the area with strongest impacts on biota from atmospheric effluents and the sector 83 represents the area with strongest impacts on biota from effluents to hydrosphere, all in the territory of Austria.

Impacts on reference animals and plants in the area of National Park Podyjí, caused by operating effluents from NNS to atmosphere, are specified in the table below.

Impacts on reference animals of operating effluents from NNS to hydrosphere at the most severely affected water course of Dyje in Austrian territory (sector 83) and, for comparison, impacts on the most severely affected water body in Czech territory (Mohelno, sector 28, population of reference organisms living in Mohelno reservoir), are also specified in the table below.

Calculated values of irradiation of individual reference organisms are so low in the whole vicinity of NNS that they make possible application of safety margin of two orders level, i.e. to increase calculated values of dose rates to individual organisms 100 times so that we are able to eliminate any possibility of underestimating the irradiation of organisms even more strictly. Safety margin at the level of factor 100 allows to assume that even in case of (unknown and purely hypothetical) activity cumulation in individual specific organisms, the biosphere is endangered by operating effluents from NNS neither in the National Park Podyjí, nor wherever in the territory of Austria.

Plants are the most severely affected organisms in case of effluents to atmosphere; up to 99.8 % of their dose rate (Gy/day) is caused by H-3 and C-14. Impacts on animals are caused by Cs, Co and I nuclides above all.

Impacts on biota from effluents to hydrosphere are zero for the area of National Park Podyjí. Dyje River is not a recipient of effluents from the NNS site in the respective area. Jihlava River joins with Dyje as far as within the system of water reservoirs Nové Mlýny.

The following nuclides contribute dominantly to the dose rate of organisms in case of the impact of effluents to hydrosphere: H-3 (15 - 20 %), Cs-137, Cs-134, Co-60, C-14 and Sr-90. Organisms living in Mohelno reservoir are most severely affected, but the impacts are 3 digit places at minimum under reference levels even here.

It is also possible to mention as a supporting argument concerning the influence of NNS operation on human beings and other live organisms that the NNS operation will not represent any dramatic change of the existing situation, that lasts for approximately 30 years already, as far as operating effluents to atmosphere and to hydrosphere are concerned. It means that even if the effluents have harmful impact on the biosphere (or measurable harmful impact on the biosphere), such harmful impact could have manifested itself already.

Sectors 130 and 118 cover the area of National Park Podyjí, the sector 106 represents the area with strongest impacts on biota from atmospheric effluents and the sector 83 represents the area with strongest impacts on biota from effluents to hydrosphere, all in the territory of Austria.

Delimitation of sectors under review

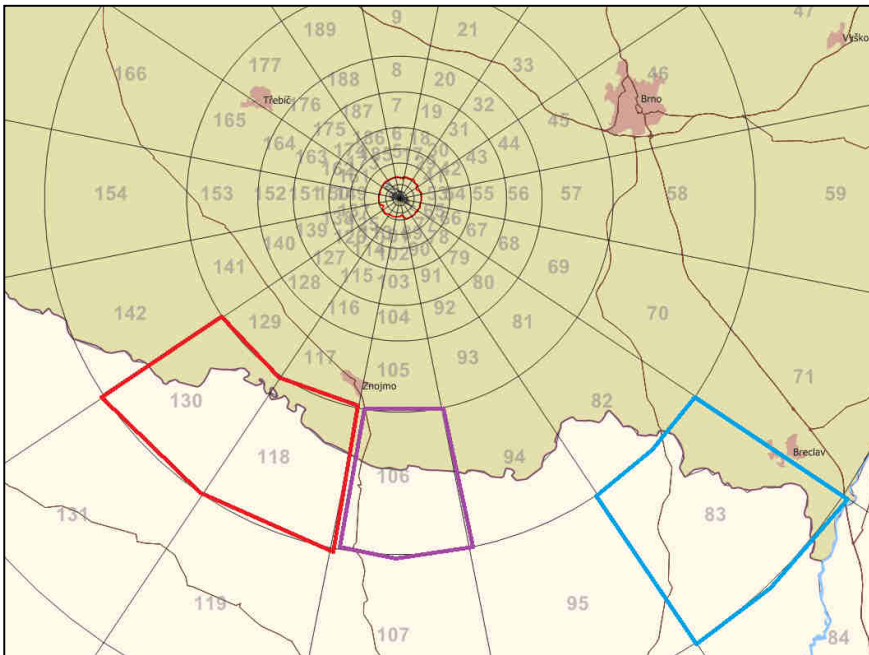


Table 1 Impacts on reference animals and plants in the area of the National Park Podyjí, calculation for the power alternative: NNS 2 x 1200 MWe, EDU1-4 decommissioning

Reference animal or plant (RAP)	Impacts on biota Sector 130 [Gy/day]	Impacts on biota Sector 118 [Gy/day]	Impacts on biota Sector 106 [Gy/day]	Derived reference value according to IAEA [Gy/day]
Deer	2.5E-13	3.8E-13	2.0E-12	1E-04 to 1E-03
Norway rat	2.8E-13	4.2E-13	2.2E-12	1E-04 to 1E-03
Duck	5.0E-13	8.1E-13	4.3E-12	1E-04 to 1E-03
Frog	8.3E-14	1.3E-13	6.5E-13	1E-03 to 1E-02
Bee	1.4E-13	2.1E-13	1.1E-12	1E-02 to 1E-01
Earthworm	3.5E-13	5.4E-13	2.7E-12	1E-02 to 1E-01
Pine	1.1E-10	1.8E-10	8.2E-10	1E-04 to 1E-03
Grass	1.0E-10	1.7E-10	7.6E-10	1E-03 to 1E-02
Trout	0.0E+00	0.0E+00	0.0E+00	1E-03 to 1E-02

Table 2 Impacts on reference animals from effluents to hydrosphere at the most severely affected water course of Dyje in Austrian territory (sector 83) and at the most severely affected water body in Czech territory (Mohelno, sector 28), calculation for the power alternative: NNS 2 x 1200 MWe, EDU1-4 decommissioning

Reference animal or plant (RAP)	Impacts on biota, Dyje River Sector 83 [Gy/day]	Impacts on biota, Mohelno Sector 28 [Gy/day]	Derived reference value according to IAEA [Gy/day]
Duck	1.1E-08	2.4E-06	1E-04 to 1E-03
Frog	5.6E-09	2.9E-07	1E-03 to 1E-02
Trout	2.2E-08	1.8E-06	1E-03 to 1E-02