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Direzione Progettazione e Realizzazione Lavori

S.S. n.21 "della Maddalena"

Variante agli abitati di Demonte, Aisone e Vinadio

Lotto 1. Variante di Demonte

PROGETTO DEFINITIVO

PROGETTAZIONE: ANAS - DIREZIONE PROGETTAZIONE E REALIZZAZIONE LAVORI

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IL COORDINATORE PER LA SICUREZZA IN FASE DI PROGETTAZIONE
geom. Fabio Quondam

VISTO: IL RESPONSABILE DEL PROCEDIMENTO :
ing. Nicolò Canepa

PROTOCOLLO	DATA

STUDIO D'INCIDENZA

Form art. 6(4) of the Habitats Directive

CODICE PROGETTO	NOME FILE	REVISIONE	SCALA:
PROGETTO: DPTO05 / LIV. PROG.: D / N. PROG.: 1601	T00IA02AMBRE02C_ENGLISH.DWG		
	CODICE ELAB.: T00IA02AMBRE02	C	-

REV.	DESCRIZIONE	DATA	REDATTO	VERIFICATO	APPROVATO
C	EMISSIONE A SEGUITO DI RICHIESTA MASE N. 172833 DEL 26/10/2023	NOV 2023			
B	EMISSIONE A SEGUITO DI RICHIESTA MiTE N. 76117 DEL 13/07/2021	LUG 2021			
A	EMISSIONE A SEGUITO DI RICHIESTA MiTE N. 23984 DEL 8/03/2021	APR 2021			

PREFACE

With reference to the Definitive Plan for the intervention *"S.S.21 "della Maddalena" – Variant for the towns of Demonte, Aisone and Vinadio. Lot 1. Demonte Variant",* with note prot. n. CDG-0497658-U of 03/08/2021, Anas S.p.A has sent the SIncA (level III) and Form art.6(4) to the Ministry of the Environment and Ecological Transition (MITE), now Ministry of the Environment and Energy Security (MASE), for the purposes of obtaining the *prior opinion of the European Commission* pursuant to art. 6 par. 4.2 part 2 of Directive 92/43/EEC.

On the basis of this documentation, the European Commission expressed a provisional opinion, Ares (2022)7469092 of 27/10/2022, with a request for additions and clarifications.

This form, continuing and completing the SIncA (level III) mentioned above, is therefore an update to the previous version that incorporates the additions developed by Anas following the opinion expressed by the European Commission.

In particular, the documentation has been compiled on the basis of further vegetation surveys and in-depth studies, while also taking into account the discussions that have taken place between Anas, the Body for the Management of the Maritime Alps Protected Area (Ente di gestione Area Protetta Alpi Marittime, APAM) for the site Natura 2000 ZSC-ZPS IT1160036 'Stura di Demonte' and the offices of the Piedmont region.

In relation to the SIncA (level III) previously filed (prot. CDG-0497658-U of 03/08/2021), the supplementary documentation:

- identifies new compensation areas for Habitat 91E0* outside ZSC-ZPS IT1160036 to integrate the compensations already provided in the SIncA filed, which have been confirmed;
- illustrates and confirms the mitigations already provided for within ZSC-ZPS IT1160036, in the SIncA filed, and illustrates the defragmentation role, outside the site, carried out by the compensation interventions;
- describes the monitoring of the compensation measures, confirming the protocol previously provided for in the SIncA filed, and prolonging the monitoring for the phase following the implementation of the interventions themselves (PO) to 8 years instead of the 3 years originally planned.

The implementation of the infrastructural intervention will have a significant negative effect on Habitat 91E0* Alluvial forests of Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), resulting in the subtraction of 1,420 m2 of habitat within ZSC-ZPS IT1160036 and the subtraction of 520 m2 of habitat outside the same site, for which it is necessary to provide adequate compensation.
The compensation within ZSC-ZPS concerns a surface area of Habitat 91E0* equal to 7,425 m2, with a compensation ratio equal to 5:1. This Form constitutes the update to the previous one, integrating the compensations planned outside ZSC-ZPS IT1160036, with the aim of including these new areas within the perimeter of the site following the expansion proposal by the competent body.

The location of the areas to be allocated for the implementation of the supplementary compensation interventions outside ZSC-ZPS IT1160036 has been derived from a dialogue between Anas, APAM and the Piedmont Region; in particular, the areas identified and the type of interventions planned are the result of sharing with APAM, which, as managing body of the site, will also be responsible for managing these areas.

ANNEX

Form for submission of information to the European Commission according to Art. 6(4) of the Habitats Directive

Member State*:* Italy Date*:* 10/11/2023

Information to the European Commission
according to Article 6(4) of the Habitats Directive
(92/43/EEC)

Documentation sent for: □ information Art. 6(4).1 X opinion Art. 6(4).2

Competent national authority:
Ente di gestione Aree Protette Alpi Marittime (Management body for the protected areas of the Maritime Alps)

Address:
Piazza Regina Elena 30 -12010 Valdieri (CN)

Contact person:

Tel., fax, e-mail:
Tel. +39 0171 976800
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apam@pec.areeprotettealpimarittime.it

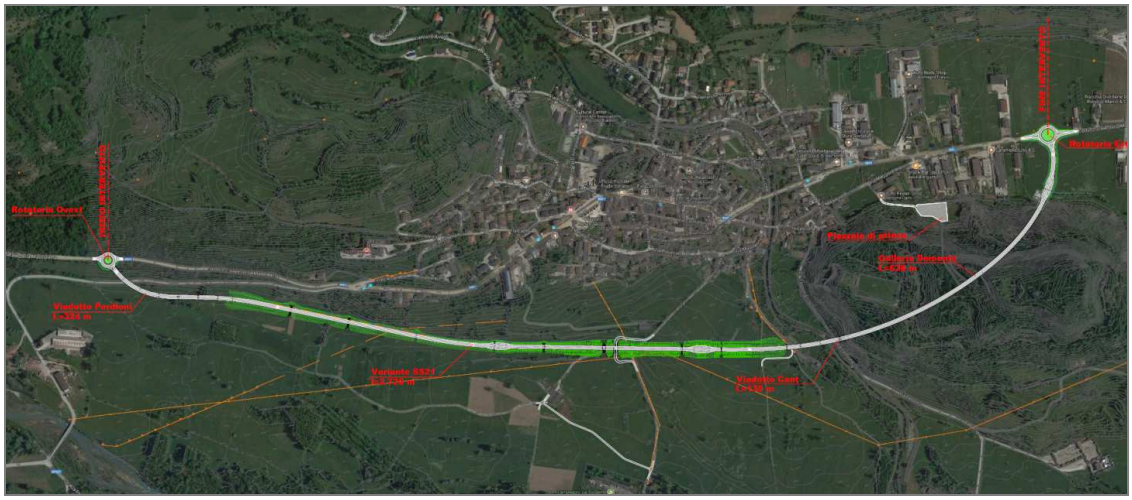
Is the notification containing sensitive information? If yes, please specify and justify

1. PLAN OR PROJECT

Name of the plan/project:
S.S. 21 “Del Colle della Maddalena” - Variante agli abitati di Demonte, Aisone e Vinadio. Lot 1. Variante di Demonte

Promoted by:
Anas S.p.A.

Summary of the plan or project having an effect on the site:
This project represents the “variation to the town of Demonte” of the roadway of the S.S. 21 "Del Colle della Maddalena” road.
The intervention of this project is entirely concentrated in the town of Demonte.
The S.S. 21 “Del Colle della Maddalena” road is an important connection in the transalpine roadway system and there is heavy commercial and tourist type traffic, often using heavy duty lorries, as well as the local traffic of the Stura Valley. The main objective of this intervention is to divert the important traffic volume of the heavy lorries away from the urban area and its relative historical centre, by creating a bypass to the urban centre.
The project route is of approximately 2.700 metres and it goes from the existing S.S. 21 road, staying on the left bank of the Stura River in Demonte. This route is considered to be a “Category C1” road of the Ministerial Decree 5/11/2001, secondary country roads, with one lane per direction and a speed limit considered between 60 and 100 km/h.



Route planimetry

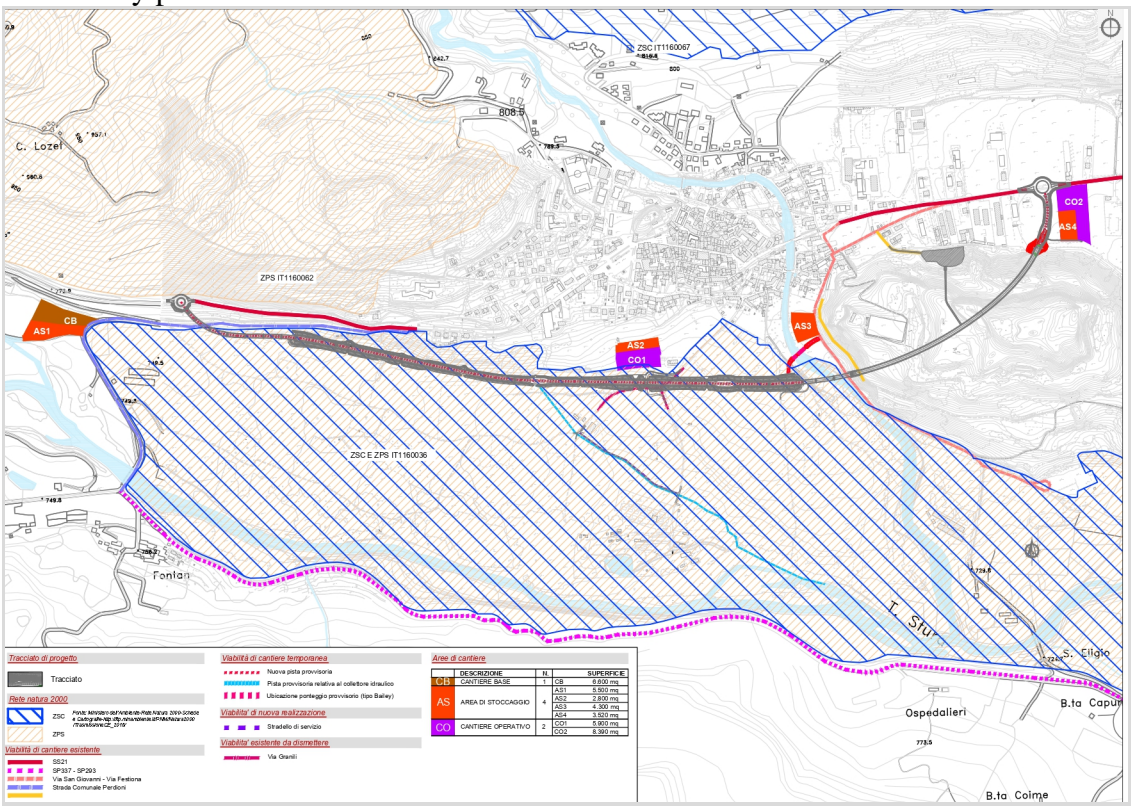
This route provides for one tunnel and two viaducts among the most important works. This route leaves the current S.S. 21 road just upstream form the town of Demonte (existing current Km 17+900 approximately) using a roundabout created at the beginning of the intervention (Rotatoria Est- East Roundabout). There is a viaduct just after the roundabout (Viaduct Perdioni L=324m), with a 5% gradient, which is created to pass over the town of Perdioni, and which then goes down to reach the other side. Then the axis reaches the progressive 1+750 approximately with a project design with 2 high radius curves (R=750m, R=1000m) separated by straight sections, maintaining a slight elevation of a few metres higher than the current quota of the land, in order to allow the insertion of 8 hydraulic crossings, 5 of which are also created to allow the

wildlife to cross and one to allow the road to cross to recreate the local roadway interrupted by Via Granili (progressive 1+332 circa). At the progressive 1+770 the Cant Viaduct begins (L=135m) which is created to cross the stream with the same name. The Demonte Tunnel opens just after this viaduct (L=638m), which has a high radius curve (R=950m), to allow the crossing of the Podio hill. There is one last 150-metre section when exiting the tunnel, which is created in elevation, until it reaches the end of intervention roundabout (West Roundabout), which is used to get back on the existing S.S. 21 (actual progressive Km 16+200 approximately).
The realisation of this intervention is supported by a worksite system, mainly designed along the project line, and which provides for a temporary base camp, two operative worksites and four temporary storage areas. We expect that the time needed to carry out this work will be of 1200 days, equal to 40 months.
Description and location of the elements and actions of the project having potential impacts and identification of the areas affected (include maps)
In order to quantify the potential impact of this project, we have analysed the aspects that may create disturbances and/or transformations, directly or indirectly, to the ZSC-ZPS 'IT1160036 - Stura Demonte' and ZPS 'IT1160062 - Alte Valli dello Stura e Maira'.
We have outlined the project sectors and actions that could be related to potential environmental pressure factors in the two following tables, as well as the resulting potential effects that could be created, during the worksite and operating phases.

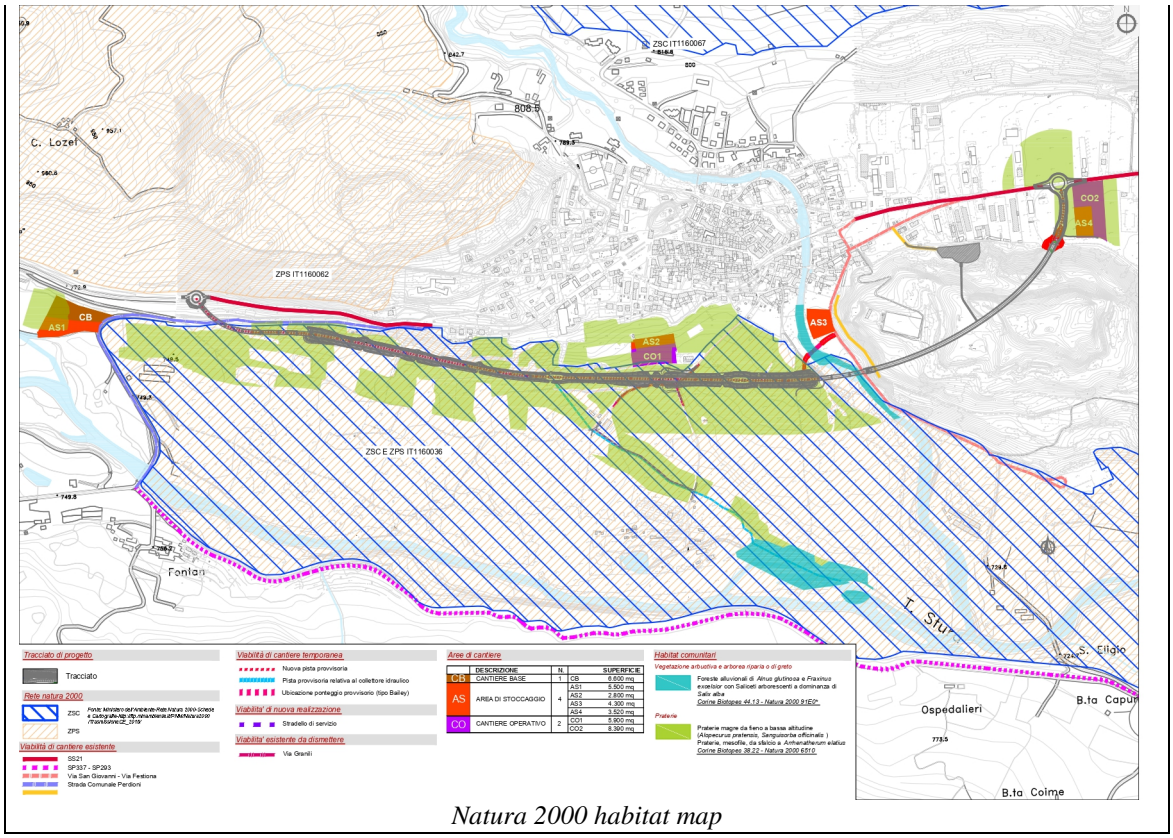
PROJECT SECTOR	PROJECT ACTIONS DURING THE BUILDING PHASE	PROJECT ACTIONS DURING THE OPERATING PHASE
Embankment	Site preparation Realisation/installation of products	Space requirement Vehicle traffic
East roundabout West roundabout	Site preparation Realisation/installation of products	Space requirement Vehicle traffic Lighting
Entrances to the Demonte Tunnel	Site preparation Realisation of tunnel entrances	Space requirement Vehicle traffic
Cant Viaduct Perdioni Viaduct	Site preparation Realisation of pile foundations Installation of abutment and piles	Space requirement Vehicle traffic
Drainage work (Concrete collecting pipes, boxes and inspection manholes; Tanks)	Excavation Installation of hydraulic manholes Installation of underground collector Restoration of the continuation ditch from the collector pipes	Space requirement Plumbing control; water treatment system
Main worksite (CB), Operative sites (CO1, CO2), Storage areas (AS1, AS2, AS3, AS4)	Site preparation Storage Use of potentially polluting substances Lighting Drainpipe discharge Downloading/ Handling of materials	
Site roadway	Movement of machinery and vehicles	Change in destined use Vehicle traffic

POTENTIAL ENVIRONMENTAL PRESSURE FACTORS	POTENTIAL EFFECTS ON THE SITE COMPONENTS	TYPE OF INTERFERENCE
Use of natural resources earth/ water	Loss of Habitat, habitat species and species	*SUBSTRACTION*
Acoustic / lighting pollution	Loss and habitat of species	
Use of natural resources earth/ water	Structure change and composition of the environmental matrix	*FRAGMENTATION*
Emissions in the atmosphere /water / soil		
Acoustic / lighting pollution		
Emissions in the atmosphere /water / soil	Alteration of Habitat and habitat species	*DISTURBANCE*
Acoustic / lighting pollution	Species disturbance	
Waste production	Disturbance of the abiotic system	
Accident risk concerning the substances and technologies used for the process	Disturbance of the abiotic system	

Two map extracts are reported below, that highlight the locations of the project works and the worksites in the Natura 200 Sites and the potential interferences with the community protected habitats.



Project Sector



Natura 2000 habitat map

ASSESSMENT OF NEGATIVE EFFECTS[1]

Name and code of Natura 2000 site affected: IT1160036 – Stura di Demonte

This site is:

X a SPA under the Birds directive

X a SCI/SAC under the Habitats directive
□ hosting a priority habitat/species
X priority habitats/species are affected

Name and code of Natura 2000 site(s) affected: IT1160062 – Alte Valli Stura e Maira

This site is:

X a SPA under the Birds directive

□ a SCI/SAC under the Habitats directive
□ hosting a priority habitat/species
□ priority habitats/species are affected

Site's conservation objectives and key features contributing to the site integrity:
The Management Plan was drawn up for the Natura 2000 IT1160062 site, edited by the Institute of Wood Plants and Environment (ILPA, 2017) and the site-specific Conservation measures were approved with the D.G.R. (Decision of the Regional Council) N. 6-4583 dated 23/01/2017.
In the Management Plan of the IT1160036 site, the adequate management objectives are indicated for the conservation of the Site's natural components, with particular reference to the environments, flora and fauna of common interest.
The following is a report of a summary of the objectives that are related to the project activities and environments as well as the species and habitats concerned in the project, in particular:
• conservation and recuperation of the grass meadow surfaces and other herbaceous communities that have a tendency to evolve towards shrub or forest type coenosis with the maintenance of traditional hay cutting practices or clearing and mowing;
• conservation and improvement of the natural humid environments, even with the acquisition of direct management of the concerned areas by the manager;
• maintenance of the management of the riparian forest habitat (91E0*) under the direct control of the Managing Body, to avoid irrational use and to verify its structural stability and evolutionary tendencies;
• conservation of the riparian forest habitats (91E0*) in evolutionary and structural conditions in balance with the river dynamics, with sampling on small surfaces with the objective of creating a mosaic of small same age populations that are far from each other;
• conservation of the environmental mosaic (open areas, prolific meadows, xeric wastelands) for the maintenance of a diversified population of Lepidopteran species, avoiding the growth of invasive tree-shrub species by regular cutting, guaranteeing the

[1] NB.: focus on the adverse effects expected on the habitats and species for which the site has been proposed for the Natura 2000 network. Include all the information that may be relevant in each case, depending on the impacts identified for the species and habitats affected.

presence of the forest-meadow margin areas and controlling the development of human activities);
• upkeep and increase of the Chiropteran hunting habitats;
• maintenance of the reproduction and hunting habitats for the bird population with the upkeep of the linear elements of the landscape (hedges and vines) and of the natural and artificial humid environments present in the towns of Moiola and Demonte.

The site specific Conservation measures concerning the forest environment, open areas, running waters, agricultural areas, plant and animal species (coleopteran, Lepidoptera, crustaceans, fish, amphibians and reptiles). The following is the list of references of the conservation measures considered connected and interesting for this project Sector and for the species that could potentially be involved in this intervention:
• Art. 5 Regulations for alluvial forests of black alder, white alder and white willow, eventually also with poplar trees (91E0*);
• Art. 15 Regulations for the stable meadows with grass cutting at low levels (6510) and mountain meadows used for hay cutting (6520);
• Art. 20 Presence of Maculinea teleius.
All the forbidden, mandatory and good practice activities for the conservation of the habitats and species are reported in these articles.

Habitats and species that will be adversely affected (e.g. indicate their representativity, if applicable their conservation status according to Art.17 on national and biogeographic level and degree of isolation, their roles and functions in the site concerned).
The following is the description of the habitats and species of common interest on which one may expect potential negative impacts after the realisation of this project.

Habitat 6510. Hay grasslands at low altitude (*Alopecurus pratensis, Sanguisorba officinalis*). This Habitat is characterised by meadows, from rich to poor and regularly cut and non-intensely fertilised, rich in flowers, distributed from the plains to the lower mountain zone, related to the *Arrhenatherion* alliance. The Representativity of this Habitat in the site is excellent (A), as well as its conservation level (A), whereas the relative surface parameter compared to the national level is below 2% (C). The overall assessment of the value for the Habitat conservation of this site is excellent (A). There are secondary origin grasslands, in which cutting (carried out 2-3 times a year) is the necessary activity for the existence of this Habitat, as well as extensive pasture, practised in certain marginal sectors of the Demonte Plain. When considering the bio-geographical aspect, the Habitat presents an inadequate conservation status with a stable trend.

Habitat 91E0*. Alluvial forests of *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*). The Representativity of this Habitat in the site is good (B), as well as its conservation level (B), whereas the relative surface parameter compared to the national level is below 2% (C). The overall assessment of the value of this site for the Habitat conservation is good (B). When considering the biogeographical aspect, the Habitat presents a bad conservation status with a declining trend. In this site, the phytocoenosis concerning Habitat 91E0* can be found along the Stura River, with major extensions and in an excellent state of conservation. Groups of *Alnus glutinosa* can also be found in the area under scrutiny on the river terrace, in a more external position, in areas in which floods occur less frequently, which in the surveyed area can be found in a mosaic that penetrates the formations with a predominance of *Salix alba*.

Considering the maturity of these phytocoenosis, they are by nature azonal and they last a very long time as they are conditioned by the level of the stratum and by the cyclical dry and wet periods. These populations are not usually managed in a form of silvicultural management except for occasional sampling.

Maculinea teleius (Phengaris teleius) (All. II and IV) is a Lepidoptera species linked to Habitat 6510, as it is a monophagus species that feeds on *Sanguisorba officinalis.* This species is mainly affected by the deterioration determined by the abandonment of traditional agricultural management practices. The population in this site has a great importance in relation to the rarity of the species and the discontinuity of the population. Considering the dimension and density of the population present in this site compared to the populations on the national territory, the value is below 2% (C), as is the conservation level of the elements of the biological habitat (C). It is considered a non-isolated population compared to the natural distribution of the species, but on the margins of the distribution areas. Considering the biogeographical aspect, it is considered in a bad state of conservation with a negative trend (last report ex art 17).

Chiropteran fauna. According to the Suitability charts elaborated during the assessment procedure, it has been found that the area of this project contains water environments (Cant stream and Stura River) that represent important feeding areas for all the Chiropteran species: *Rhinolophus ferrumequinum, Rhinolophus hipposideros, Myotis daubentonii, Myotis emarginatus, Myotis myotis, Myotis mystacinus, Myotis nattereri, Pipistrellus kuhlii, Pipistrellus pipistrellus, Nyctalus leisleri, Hypsugo savii, Eptesicus serotinus, Barbastella barbastellus, Plecotus auratus, Tadarida teniotis.* Overall, the Chiropteran fauna found in this area is particularly rich qualitatively, including the presence of two endangered species at the national level (*R. Hipposideros and B. barbastellus*) and five vulnerable species (*R. ferrumequinum, M. emarginatus, M. myotis, M. mystacinus, M. nattereri*). Five species have been inserted in Annex II of the Habitat Guidelines (*R. ferrumequinum, R. hipposideros, B. barbastellus, M. emarginatus, M. myotis*) one of which is almost endangered at the global level (*B. barbastellus*).

Nesting avifauna. Nesting avifauna is typical of the traditional agricultural environment (Little owl, Hoopoe, Wryneck, Lesser Grey Shrike) and there is also a good presence of typical forest species (Great spotted woodpecker, Common chiffchaff, Marsh tits, Eurasian Nuthatch). The most common species (Eurasian blackcap, Blackbird and Common chaffinch), are widely diffused in this Region and are typically found in the ecotone environment characterised by the alternating open habitats (arable fields and meadows), interspersed by linear elements (hedges and vines) and forest covered areas. The riverbed of the River Stura and the natural and artificial humid environments found in the town of Moiola and in the plain of Festiona (Demonte), are excellent reproduction environments for certain species of waterfowl such as Little Grebe, Mallard, Moorhen, Little Ringed Plover and Common Sandpiper, that further enrich the nesting ornithic population in this site. There are 17 species recorded in this site that are listed in Annex I of the Birds Directive, and only two species reproduce here (kingfisher and Lesser Grey Shrike), while the others are only present during the migratory periods or they nest nearby and use this area to provide food. Only the Lesser Grey Shrike reproduces regularly with a good number of couples, even if their number is still unknown. According to available data, concerning point surveys carried out on

this site and its immediate vicinity in the years 2001 to 2009, we have observed that the population of this species was stable in terms of diffusion on the territory.

Importance of the site for the habitats and species that will be affected (e.g. explain the role of the site within the national and biogeographical region and in the coherence of the Natura 2000 network).

The river corridor of the Stura in Demonte IT1160036 Stura di Demonte, has excellent natural characteristics and conservation, compared to other alpine rivers, as it guarantees the presence of a semi-natural mosaic of different Habitats linked to the river dynamics, in which the forest plays an important role in the alluvial area, with a diffused population of white alder woods (Alnus incana) and white willow woods, including the presence of black alder (Alnus glutinosa) which can be found exclusively on the edges of the alluvial plain; all these coenosis are part of the 91E0* Habitat. The secondary meadows (Habitat 6510) play an important role in the vegetation mosaic because of their extension and composition since not only do they represent a protected Habitat at the European level, but they are also particularly adequate for the *Maculinea teleius (Phengaris teleius)* species, which is rare and unevenly distributed, found only in a section of the Pianura Padana (Po Valley), which represents the southern limit of its range. The populations linked to Habitat 6510 suffer because of the deterioration of this Habitat and the lack of traditional farming practices. This species is considered vulnerable because each population is isolated and composed of a small number of individuals.

Description of adverse effects expected (loss, deterioration, disturbance, direct and indirect effects, etc.); extent of the effects (habitat surface and species numbers or areas of occurrence affected by the project); importance and magnitude (e.g. considering the affected area or population in relation to the total area and population in the site, and possibly in the country) and location (include maps)

According to the analysis of the actions of the intervention, we have found that the potential expected effects that are due to three different types of interference, (removal, disturbance and fragmentation) are:

- loss of Habitat, habitat species and species;
- change in the structure and composition of the environmental matrix;
- alteration of Habitat and habitat species;
- species disturbance;
- disturbance of the abiotic system.

These potential effects have been analysed to assess the existence of the impacts and their importance in both of the concerned sites of Natura 2000 involved in this project (ZSC-ZPS IT1160036 Stura di Demonte ZPS IT1160062 Alte Valli Stura and Maira).

We also assessed the Site ZPS IT1160062 Alte Valli Stura and Maira, and after the screening we were able to exclude, beyond reasonable doubt, the possibility of significant negative impacts.

Whereas at the end of the screening for the Site ZSC-ZPS IT1160036 Stura di Demonte, it was deemed necessary to study certain project aspects, which, because of their nature and location close to potentially delicate environments for species in need of more protection, and due to their significant impact for the Habitat and species.

In particular the study was concentrated on:

REMOVAL	Occupation, consumption of soil and removal of vegetation (Habitat 6510 e 91E0*)
	Mortality due to road kill
	Removal of animal habitats due to acoustic disturbance
	Loss of Habitat and species habitat due to liquid or gas pollution with the emission of polluting substances in the atmosphere/soil/water
DISTURBANCE	Alteration of Habitat and species habitat due to liquid or gas pollution with the emission of polluting substances in the atmosphere/soil/water
	Noise pollution creating a disturbance of habitat and species
FRAGMENTATION	Fragmentation of the riparian vegetation (Habitat 91E0*)
	Loss of ecological mosaic elements such as vines and hedges

Occupation, consumption of the soil and removal of the vegetation

Removal of common Habitats

The habitats involved by the work for this project and relative sites are habitat 6510 and 91E0*.

We have created the tables with the Habitat areas involved in the realisation of this project below, they contain the details of the type of Habitat, the permanent or temporary removal, inside and outside of the Natura 2000 Site, object of this survey.

Habitat 6510

The interventions that are carried out in the area of Habitat 6510 inside the Natura 2000 Site, and which will be removed permanently, are represented by the road sections in elevation and by the piles of the Perdioni Viaduct, whereas the temporary occupation is determined by the presence of the worksite roadways, by the realisation of the Perdioni Viaduct and the realisation of the collecting pipes drainage system.

	A	***B***	***C***	***D***	***E***	***F***	***G***
Cod. Habitat Natura 2000	***area of habitat***	*area inside the SAC/SPA*			***area outside the** SAC/SPA*		
		total removal	***temporary removal***	***permanent removal***	***total removal***	***habitat reconstruction***	***habitat area increase***
6510	***ha***	***m2***	***m2***	***m2***	***m2***	***m2***	***m2***
	373.33	54,769	24,803	29,966	31,596	40,847	9,251
		% on A	***% on B***	***% on A***	***% on A***	***% on E***	***% on A***
		1,47%	45,29%	0,80%	0,85%	129,28%	0,25%

If we consider the ratio between the area of Habitat involved by the project works and the total area of the Habitat in the Natura 2000 Site (source Formulario Natura 2000) we can observe that the total area of Habitat 6510 involved in the project works is equal to approximately **1,47%** of the total area of the Habitat in the Natura 2000 site, and approximately **0,80%** of this area will be used for actions geared towards the natural re-creation of the habitat.

After assessing the nature of Habitat 6510, that requires active traditional management, the relatively low area of the Habitat that will be lost, the high potential of the territory inside the Natura 2000 Site for Habitat 6510 (a few areas are not well managed or not managed as permanent hay meadows) and what's more considering the actions required to improve the natural recomposition of the habitat that are considered compensatory measures, we consider that the incidence can NOT be considered significant for the conservation of the Habitats inside the Natura 2000 Site.

Habitat 91E0*

The interventions that will be carried out in the Habitat 91E0* area or potentially adequate inside the Natura 2000 Site, are the realisation of the Cant Viaduct and the reconstruction of the existing trapezoid shaped land ditch close to the Stura River, and the area outside of the ZSC relates to the Bailey bridge.

	A	*B*	*C*	*D*	*E*	*F*	*G*
Cod. Habitat Natura 2000	***area of habitat***	*area inside the SAC/SPA*			***area outside the** SAC/SPA*		
		total removal	***temporary removal***	***permanent removal***	***total removal***	***temporary removal***	***permanent removal***
	ha	***m2***	***m2***	***m2***	***m2***	***m2***	***m2***
91E0*	78.66	1420	1420	0	520	520	0
		% on A	***% on B***	***% on A***	***% on A***	***% on E***	***% on A***
		0,18%	100,00%	0%	0,07%	100,00%	0%

The area of Habitat 91E0* involved in this project is equal to 0,18% of the total area of the Habitat in the Natura 2000 Site, and if we consider the area outside this site we reach a total of 0,25%.

Although the area of Habitat removed temporarily by the works is relatively low, inside and out of the site, when we assessed the priority nature of the forest type Habitat, and the excellent state of conservation inside the site of the vegetal communities involved in this operation, and as we know these are mature and well structured phytocoenosis, we have concluded that there will be permanent negative impacts to Habitat 91E0* due to this operation, even if we consider the benefits of the compensatory measures we will adopt.

<u>Removal of habitat species</u>

There are vegetal communities that can be considered Habitat communities or not, inside and in the areas surrounding the ZSC, which represent important habitats for the existing wildlife species.

The works involved in this project create a temporary removal involving these habitats (work site areas, storage site areas, collecting pipes) and permanent removal (abutment and Cant and Perdioni Viaducts) that are summarised in the following table.

SPECIES HABITAT	*Area inside the SIC/ZPS*			*Area outside the SIC/ZPS*		
	TOTAL REMOVAL m²	**PERMANENT REMOVAL m²**	**Temporary removal m²**	**TOTAL REMOVAL m²**	**PERMANENT REMOVAL m²**	**Temporary removal m²**
Aquatic environments and riverbeds	0	-	-	0	-	-
Riparian forests	1420	0	1420	520	0	520
Urban or degraded areas	1840	790	1050	4200	1308	2892
Stable meadows	54769	29966	24803	31596	0	31596
Meadows, uncultivated	1645	140	1505	2220	0	2220
Cultivation	1565	915	650	0	-	-
Hedges and vines	430 linear metres	430 linear metres	0	90 linear metres	0	90 linear metres
Forests and mainly deciduous tree	1652	528	1124	6638	1574	5064

forests						
Arboriculture systems	0	-	-	0	-	-
Coniferous forest repopulation	0	-	-	1974	14	1960

It is obvious that compensatory measures must be implemented considering the removed areas, to reduce the level of the impacts on meadow habitats (provided in the project) to a non significant one, concerning the objective of the protection of the *Maculinea teleius* species and the conservation state of its population.

Mortality due to road kill

Direct mortality of fauna species can be determined by vehicular traffic during the operative and building phases, due to accidents or collisions for the flying species, using noise-absorbing barriers.

Considering the high visibility of this road and the reduced speed imposed by the speed limits, the low night traffic level and the absence of tangency points between the embankment and the main elements of the ecological network, this road is considered to have a low danger level involving the risk of accidents for the existing fauna.

Loss of Habitat and species habitat due to liquid or gas pollution with the emission of polluting substances in the atmosphere/soil/water

When considering the estimated traffic (Scenario 2030) it is obvious that this project does not determine air pollution risks, due to the emission of exhaust fumes.

Compensatory measures have been adopted for the water management that are adequate to exclude the phenomenon of possible chemical pollution of the superficial water (Cant and Stura streams).

Removal of wildlife habitats due to acoustic disturbance

All the phases of the realisation of the work for this project involve an increase in noise and vibrations in the areas surrounding the intervention areas. The implementation of the road will also produce an acoustic climate change around the infrastructure due to traffic.

All the areas in which the noise of the traffic and worksite activities will be higher than the 50 db limit, reported in recent papers, where the number of elements of the various species can be expected to diminish, must be considered disturbance points.

The areas subject to this incidence will be the forest area during the worksite phase, outside the ZSC-ZPS, in the eastern portion of the intervention which will be involved in the realisation of the tunnel and the meadow area surrounding the route of the road, which, contrary to the latter, will continue to be subject to a certain level of disturbance even after the implementation of the road.

The riparian vegetation of the Stura River, inside the ZSC-ZPS “Stura Demonte”, will not be involved by this incidence, because the distance from the worksites and from the object of the project is always above 400 metres, except for the limited work (in terms of time and intensity) needed to adjust the existing pipes for the creation of the collector pipes.

To conclude, the sitework and implementation activities of this project will only create a disturbance on the species that nest in the meadows, mainly Lesser Grey Shrike and Lark, determining a smaller capacity for the habitat for the nesting of these species south of the embankment, because the northern portion is already subject to noise

disturbance due to the SS21 and the town of Demonte. We therefore consider the incidence to be NON significant.

Fragmentation of the riparian vegetation (Habitat 91E0*)

According to the Habitat map it is possible to assess the extension of the riparian zone involved in this project to build the Cant Viaduct which is equal to150 m^2; according to point studies, that cannot be seen on the scale of the Habitat map, we can observe that the riparian vegetation in Habitat 91E0* is heavily rarefied exactly where the Cant Viaduct crossing will be created. It can therefore be considered that there will be temporary removal during the working phases that will not determine a removal of riparian vegetation, but only a removal of an area potentially adequate for the latter.

Concerning the restoration of the existing soil ditch on the banks of the Stura River, the working phases involves Habitat 91E0* for an area of approximately 800 m^2.

Considering the relatively low area of the Habitat that will be lost temporarily (approximately 0,18%) inside the Natura 2000 Site and considering that the removal will be along a limited length of the zone, we can declare that the negative impacts that can be identified compared to the fragmentation of Habitat 91E0* are not significant for the conservation of the Habitat in the Natura 2000 Site, or for the integrity of the ecological corridor composed by the waterway.

Loss of ecological mosaic elements such as vines and hedges

430 linear metres of hedges and vines will be removed with this project. Considering the fragmentation and the low number of these elements in the Natura 2000 Site, we have deemed it necessary to provide compensatory measures to reduce the changes in the environmental matrix structure that will be caused by the removal of the latter. With the activation of these measures the incidence is non significant.

A summary of level II is reported below.

Potential effects		**Result**
Occupation, consumption of soil and removal of vegetation (Habitat 6510 e 91E0*)	Negative impacts reported concerning Habitat 6510 are considered non significant (compensatory)	
	There are still significant effects due to the operations on Habitat 91E0*	Assessment of alternative solutions
Mortality due to road kill	Negative impacts reported concerning the components of the fauna are considered non significant (compensatory)	
Loss of Habitat and species habitat due to liquid or gas pollution with the emission of polluting substances in the atmosphere/soil/water	Negative impacts reported concerning the components of the fauna are considered non significant (compensatory)	
Fragmentation of the riparian vegetation (Habitat 91E0*)	Negative impacts reported concerning Habitat 91E0* are not significant	
Removal of wildlife habitats due to acoustic disturbance	Negative impacts reported concerning the components of the fauna are considered non significant (compensatory)	
Loss of ecological mosaic elements such as vines and hedges	Negative impacts reported concerning the components of the fauna are considered non significant (compensatory)	

Potential cumulative impacts and other impacts likely to arise as a result of the combined action of the plan or project under assessment and other plans or projects.
We do not know of any other project that could have a cumulative impact as a result of the actions combined with this project.

Compensatory measures included in the project (indicate how these will be implemented and how they will avoid or reduce negative impacts on the site).
This project adopts an articulate system of mitigation measures to prevention and contain the potential impacts. The following lists the main mitigation measures provided to protect the community protected species, habitat and habitat species, both during the worksite phase and the following operating phase. The list includes some interventions, which have a wider environmental value, with positive repercussions on the preservation of the integrity of Natura 2000 sites and on the overall coherence of the Natura 2000 Network.

1. Actions for the natural reconstruction of Habitat 6510 and hay producing meadows where there is the presence of *Sanguisorba officinalis* (Great burnet)
These actions consist in light tillage of the soil, organic fertilisation, followed by rolling and hand sowing with seeds of locally sourced hay and wildflower species, in areas in which one can find the *Sanguisorba officinalis*.
This action is implemented to protect and conserve Habitat 6510 as well as the Lepidoptera *Maculine teleius* (Large blue).

2. Planting linear vegetation elements (hedges and vines)
After having identified the significant elements of the local ecological network within the site, the project has planned for the planting of linear elements, such as hedges and vines, with the same structural characteristics and specifications as those currently there. The reconnecting of hedges and vines has been planned with an orientation predominantly parallel to the road axis, in order not to invite fauna, especially chiroptera and birds, to cross the route.
Furthermore, during the planning stage, particular attention was paid to preserving the larger trees, these old-growth specimens having characteristics that are potentially suited to sheltering avifauna, chiropterofauna and xylophagous invertebrates.

3. Planting tree bands along embankments to increase the height of the flying trajectories of chiropterans and birds
In correspondence with the embankments (higher than 5 metres) that are built with double banks, we have provided for the plantation of "Tree Bands" parallel to the road infrastructure, in order to increase the flying altitudes of the Chiroptera and Birds and avoid them being killed by being hit by vehicles. This intervention was deemed essential, in particular in correspondence with the fairly high embankments, in order to raise the flying altitudes of Chiroptera and Birds, significantly reducing the possibility of them being hit by vehicles.

4. Plantation of vegetation interventions for the road embankments
We have provided for the revegetation of the embankments and the plantation of shrubs in order to accelerate the natural process of environmental recomposition.

5. Storage and recovery of vegetable soil for the implementation of renaturation intervention

The conservation of the vegetable soil is planned for subsequent reuse. The vegetable soil allow to limit the use of alien vegetable soil and to exploit the seed bank of the grassy plant formations of the area, naturally present in the soil.

6. Road waste water collection and treatment

This project provides for the collection and treatment of all the water that is collected from the road platform, using first rainwater tanks (degreasing and sedimentation) and safety tanks (accidental accumulation spillage). This project choice allows us to minimise the possibility of a long-term alteration of the soil composition downstream from the road embankment that would cause a disturbance and loss of Habitat 6510.

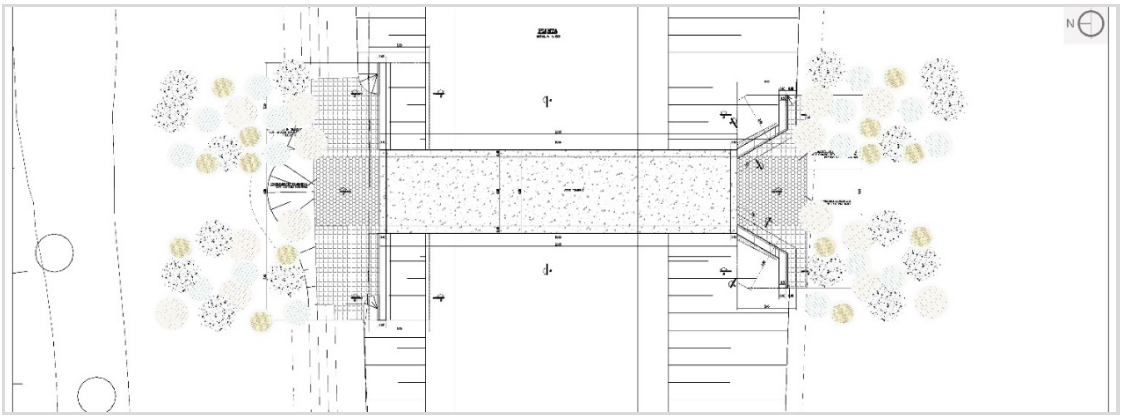
7. Creation of wildlife crossing passages with vegetation invitations

This project provides for the positioning of 5 box structure designed ad hoc to allow the crossing of small and average size wildlife, with dimensions of 2.5x4 m (n.2), 2x4 m, 5.5x7 m, 3.5x3.5 m.

Taking into account the conditions necessarily imposed by the road gradient, every box structure has been placed along the route, maintaining a minimum height of 2 metres for each object and increasing the width in relation to the length of the passage (i.e. the cross-section of the road, which on average is equal to approximately 22 m). It was therefore possible to locate 5 underpasses, spacing them between 150 and 200 m apart, with the exception of the stretch between progr. 650+00 and 1150+00, in which the lay of the land (with an almost hilly outline in the central part) did not allow a passage with adequate dimensions to be positioned there. Finally, the box structures planned are not only functional for allowing the fauna to pass, but also for hydraulic transparency, i.e. guaranteeing the normal outflow of water along the plain in the presence of the work. In any case, stagnation of water is not forseen in correspondence with these constructions, and, assuming that the walkway along the passage will normally be dry, gangplanks have not been included.

In general, in application of the "Arpa Piemonte, 2005. Wild fauna and linear infrastructures" guidelines, the planning of the underpasses has been in accordance with the following criteria:

- access at the same ground level or with a minimal slope, without ramps or jumps, dictated by the natural configuration of the land, which is characterised by a slight slope towards F. Stura,
- the choice of a natural type of substrate, i.e. cement conglomerate with natural pebbles,
- covering the section in front of the guard ditch with geomat blocked with cold applied bituminous gravel to be hydro-seeded, so as not to interrupt the continuity of the passage and, at the same time, maintain the draining function,
- inclusion of fencing and invitation vegetation.



Finally, the adoption of a fence along the whole perimeter of the area of intervention is planned to prevent access to the road by terrestrial fauna. This fence, which is suitable for both large mammals and small and medium sized fauna, is installed in conjunction with the adopting of wildlife passages, so as to maintain the permeability of the infrastructure without causing damage to wild fauna.

8. Installation of fencing to prevent the fauna from crossing the road

We have provided for the installation of wire mesh of increasing size with height, to prevent the land animals from walking across the roadway and to decrease the mortality rate due to accidents with vehicles.

We will also use this kind of fence during the worksite phase, along the perimeter of the main worksites.

9. Specific operating methods during worksite phase

To safeguard the acoustic climate in the Natura 2000 Sites, modulation of activities is recommended during the construction phase, to regulate the noisiest activities during the twilight hours and in the reproductive period of many species of birds (spring).

The project provides also a specific operating and management methods during the worksite phase, with a wide environmental value, that further limit the potential disturbance on wildlife and habitats.

The project includes:the safeguard of the acoustic climate: correct choice of machinery and equipment; constant maintenance of the vehicles and equipment; correct operating modes and worksite preparation; carrying out the work concerning the existing pipe, to be connected with the end section of the hydraulic collector, and not to be done during the reproduction period of the bird population; soft modified bitumen must be used to create the road surface, which can reduce noise emissions of approximately 4 dB (A);the safeguard of the air quality: containment of dust dispersion;the safeguard of the water and soil: management of the resulting materials and liquids and of the storage of waste; waterproofing of the worksite areas; collection and treatment of worksite's platform water.

10. Installation of the worksite and roundabout lighting systems with high lighting efficiency

We have provided for the use of high-efficiency luminous led source projectors installed on poles, with low or null production of the emission of light with wave lengths that correspond to ultraviolet, violet and blue. We have chosen a type of lighting that uses new generation LED equipment, with high efficiency lighting, combined with light flow

control systems that use communication systems with ”channelled waves” that are capable of channelling the light flow towards the ground, to avoid flow dispersion.
The use of this kind of lighting equipment answers the shelter protection requirement, to minimise the disturbance on the winter sites, to not alter the hunting sites significantly and to avoid increasing the collision rate of the Chiropterans with passing vehicles.

11. Installation of a Bailey type bridge to protect the Cant Stream
It is necessary to solve the problem of the Cant stream crossing by heavy machinery, for an efficient realisation of the required workload. The crossing will be realised upstream from the work area, outside the Natura 2000 Sites, with the installation of a Bailey type bridge (temporary).
This solution significantly reduces several impacts on water and soil that would have been implied had a ford crossing been chosen, and the details of this solution imply:
- decrease in the impact due to the deviation and /or interruption of the stream, with the prevention of the change of the superficial water flow, since it will not be interrupted;
- decrease in the impact due to the alterations of the chemical/physical state due to spillage or emission of polluting or harmful substances in the soil/water;
- decrease in the impact related to the interruption of the ecological continuity in running water ecosystems, with the prevention of any impact on the aquatic ecosystems that will not be involved.

3. ALTERNATIVE SOLUTIONS

Identification and description of possible alternative solutions, including the zero option (indicate how they were identified, procedure, methods)

The final project for the roadway called "SS.21 della Maddalena, Lot 1, "Variante di Demonte", studied a series of alternative solutions to verify the existence of possible solutions that would be capable of preventing the impacts that could be harmful to the integrity of the Natura 2000 Sites.

The possible solutions were identified, bearing in mind the objective of the intervention. This objective is the solution to the problems associated with the presence, along the route S.S. 21, of high traffic volumes going through the urban areas and the presence of narrow lanes, curves and narrow passages, which all limit the viability of this road, as well as the urban areas themselves.

5 alternative solutions have been studied, including the one concerned by the previous assessment levels of the Environmental Impact Study (alternative 5), to which the solution of non-intervention was also added (Alternative 0).

The details and comparisons of the single alternatives are described below, verifying the compatibility with environmental components and assessing the potential interferences that could have an impact on the concerned Natura 2000 Sites.

In particular, the interferences with the Natura 2000 Sites and the components of the Regional Ecological Network (RER) have been analysed for each alternative solution. We have also taken into account the interferences with the hydraulic- geomorphologic component that determines a strong influence during the design phase, with important impacts on the other environmental matrices as well.

ALTERNATIVE 0 (non-intervention)

The existing route of the S.S. 21 road "della Maddalena", between Demonte and Vinadio, is developed on the left bank of the Stura di Demonte, halfway up the hill, in an elevated position compared to the bottom of the valley; the route in this section connects and crosses the urban centres of Demonte, Aisone and Vinadio.

When it crosses inhabited centres, even historical types, the road S.S. 21 crosses urban sectors, not very wide and with frequent intersections of urban traffic, and with the on-going opening of residential and commercial doorways on the roadway, in the presence of high pedestrian passage as well.

Considering the current position of the S.S. 21 road, it is immediately clear that a local rectification of the route, or a local variation, are not technically viable solutions, and cannot be carried out by crossing the urban centre od Demonte.

The non-intervention solution is not possible either, as it doesn't solve the existing problems. In fact, on the technical side, the so-called *option zero* doesn't answer the requirements of the local mobility and does not allow us to overcome the current problems, related to the intense traffic in the urban area. From the environmental point of view, moreover, *option zero* has more issues concerning air quality and acoustic climate, considering the direct impact on the urban area.

Option zero is dismissed, following these considerations, as it is considered non sustainable and not in line with the operation's objectives.

ALTERNATIVE 1 (preliminary project, with a bypass upstream from the populated area);

The route for alternative 1, with a length of approximately 3.600 m, going from east to west, begins at the existing S.S. 21 road, just before the populated area of Demonte,

using a roundabout intersection. After approximately 200 metres, one enters the first tunnel (Demonte Tunnel 1), of a length of 1.805 m. The tunnel curves towards the left with a constant radius of 900 metres; the west entrance is placed where the deep incision of the Cant Stream is, which is crossed with a viaduct with one single bay with a length of 28 metres. The west side of the viaduct coincides with the eastern entrance section of the second tunnel (Demonte Tunnel 2), with a length of 1.265 metres. The route in the tunnel is straight and then there are two curves before the end of the tunnel on the western entrance, where we find a second roundabout, created on an embankment in reinforced soil that reconnects the route to the existing S.S. 21 road.
This alternative presents interferences with the Natura 2000 Network and the Components of the RER when intercepting the ZPS IT1160062 Alte Valli Stura and Maira and the areas called "Zones of good connection to be maintained and enhanced" as well as the IBA 035 Maritime Alps.
What's more, it presents significant interferences with the hydraulic and geomorphological components by crossing the Cant Stream in an area defined as active landslide. The route passes through areas protected by hydro-geological constraints, ex R.D. 3267/23.

ALTERNATIVE 2 (preliminary project, with a bypass downstream from the populated area and partially on the right bank of the Stura di Demonte)
Alternative 2, with a length of 4.075 m, begins on a new project roundabout placed on the existing S.S. 21 road, at approximately 1,5 km from the populated area of Demonte (approximately Km 15+500), and ends at the reinsertion on the current road S.S. 21 upstream from the populated area (current progressive Km 18+600 approximately), using a new project roundabout. The route begins with a straight elevated section of approximately 430 metres; then there is a curve to the left with which one enters the first part of the tunnel (Il Podio tunnel L= 397 metres), and at the end of this section there is another uncovered section of approximately 550 metres until one reaches the first viaduct (Ospedalieri Viaduct L= 873 metres) used to cross the Cant Stream and the Stura of Demonte Stream. The route goes on on the right bank of the Stura stream, with an open air section of approximately 1000 metres, mainly in a trench, with a succession of two curves to the right that lead to the second crossing of the Stura stream with the viaduct (Madonna del Bosco Viaduct L= 405 metres). There is another curve to the right after this last viaduct, and after approximately 470 metres, you arrive at the entrance of the new project roundabout, where this operation ends.
The alternative presents interferences with the Natura 2000 Network as it crosses and goes along the ZSC/ZPS IT1160036 Stura di Demonte and involves the "ecological corridors of the Stura di Demonte Stream - Corridor that must be strengthened" as well as the IBA 035 Maritime Alps. It also presents interferences with the hydraulic and geomorphological components involving unstable areas with slope landslides, active or potentially active conoid areas that are not protected by protection works or upstream barriers, with high danger levels and areas of non-recently activated conoids.
The route encounters the Cornaletto dry stream, the Cant Stream, the Stura di Demonte Stream in flood areas with high danger levels (Ee) and high (Eb).
The route passes through areas protected by hydro-geological constraints, ex R.D. 3267/23.

ALTERNATIVE 3 (adjustment of the road SP 337)
The route of this alternative 3 provides for the local adjustment of the provincial road S.P. 337. Concerning the functional aspect, this solution does not provide for the

identification of an alternative variant for the transit along the S.S. 21 road, especially for the heavy machinery, but rather a strengthening of the existing provincial road. The existing S.P. road presents inferior geometric characteristics, compared to the standards of a new route that would be compliant with the Ministerial Decree 5/11/2001, and it would need the adjustment of the whole section between Demonte and Vinadio, between the area of Festiona (Demonte) Pratolungo-Roviera (Vinadio), in order to reach full functional efficiency.
Concerning Lot 1, which allows the route to bypass the inhabited centre of Demonte, the route is developed for approximately 6.500 metres, and involves the adjustment of the existing road S.P. 337, as well as a new variant section in a tunnel with a length of approximately1.170 metres. This solution provides for the passage on the right bank of the Stura, using the road S.P. 337 whenever possible, as well as the existing connections with the existing road S.S. 21. The route of road S.P. 337 begins, from east to west, from the existing road S.S. 21 in the location called Festiona, at approximately 4 km from the inhabited centre of Demonte; the route covers most of the route of the existing road S.P. 337 and crosses the existing bridge on the Stura, in the same location and reaches the right bank, we also provide for the renovation and rectification of the road S.P. 337. The reconnection with the existing road S.S 21 will be after the populated area of Vinadio, using a viaduct.
This route presents interferences with the main environmental systems of the Natura 2000 Network and with the components of the RER, and intercepts the ZSC/ZPS IT1160036 Stura di Demonte, going along and interfering with the riparian zone of the Stura and consequently the relative Corridor that needs to be strengthened and the good connection zones that must be maintained and strengthened. The interferences with the hydro-geomorphologic components involve the crossing of the Stura di Demonte Stream and the involvement of flood areas with high danger (Ee); the route also intercepts many unstable areas with slope landslide movements such as active or potentially active conoid areas, that are not protected by upstream barriers, with high danger levels, conoid areas not recently activated, a dormant landslide area and areas with hydro-geological constraints, ex R.D. 3267/23.

ALTERNATIVE 4 (feasibility study, with a bypass downstream from the populated area and completely on the left bank of the Stura di Demonte) AND ALTERNATIVE 5 (final project, concerning the strengthening of the alternative 4)
The route of alternative 4 is characterized by a short length of approximately 2.100 metres and concerning the functional aspect, the plano-altimetric development is compliant with the Ministerial Decree 05/11/2001.
The route of alternative 4 begins on the existing road S.S. 21 just downstream from the town of Demonte (progressive km 16+100 approximately from the actual road), and reconnects with the existing layout upstream from the town (progressive actual Km 17+900 approximately). The variant is placed at approximately 800 metres form the town of “Laghi di Rialpo”, and it begins with a new roundabout intersection. The initial section of the variant is open and on an embankment for approximately 200 metres; then, after a curve to the left, there is a tunnel (Demonte tunnel L= 556 metres) to pass the Podio hill, and then the exit onto a viaduct (Cant viaduct L= 238 metres) to cross the Cant stream. The route continues on an embankment for another 500 metres approximately, and then there is the last section on a viaduct (Perdioni viaduct L= 556 metres) after which one reconnects to the existing road S.S. 21, using a second new roundabout.

Alternative 4 is a complete variant and does not interfere with the current local traffic. The access roads for the fields encountered with this route are by-passed using the viaduct and the S.C. Perdioni is passed with a box shaped structure inserted in the embankment.
The route of alternative 5 uses a large part of this alternative 4 route, so it is similar concerning the functionality of the intervention. Alternative 5 is different from alternative 4 because it introduces several optimizations such as the longer distance from the populated area of the west entrance on the existing road S.S. 21, with the design of a new roundabout; the plano-altimetric route of the axis; the development of the major art works; the increase in the external margins, etc.. In terms of corridors, alternative 5 is thus very similar to alternative 4, but it is optimised.
The route of alternative 5 runs planimetrically for approximately 1.800 metres, the corridor used in the previous solution, with small differences, to then continue in a variant for another 900 metres approximately and connect to the existing road S.S. 21 with a new roundabout (progressive actual Km 18+700 approximately) upstream from the town of Demonte. The route of alternative 5 is disconnected just downstream from the town of Demonte (progressive km 16+200 approximately from the actual road), and reconnects with the existing layout upstream from the town (progressive actual Km 18+700 approximately) with an extension, including the connection to the S.S. 21 road, with a length of approximately 2.700 metres.
The first part of the variant has a transversal direction in the valley and passes the Podio hill with a tunnel (Demonte tunnel), and subsequently, the Cant stream with a viaduct (Cant viaduct). The route continues on an embankment until the next viaduct (Perdioni viaduct) and ends with a second intersection with a roundabout on the existing road S.S. 21.
Alternative 5 is a complete variant and does not interfere with the current local traffic. The access roads for the fields encountered with this route are by-passed using viaduct and the S.C. Perdioni is passed with a box shaped structure inserted in the embankment.
This alternative presents interferences with the Natura 2000 Network and with the components of the RER, and intercepts the ZSC/ZPS IT1160036 Stura di Demonte and partially the ZPS IT1160062 Alte Valli Stura and Maira as well as the IBA 035 Alpi Marittime
The hydro-geomorphological components of this route are in active or potentially active conoid zones that are not protected by upstream protection barriers, with high danger levels (Ca), in non-recently active conoid areas (Cn), and in areas under hydro-geological constraints, ex R.D. 3267/23, and also involves flood areas of medium or moderate danger levels (Em).

<u>Evaluation of alternatives considered and justification of the alternative chosen (reasons why the competent national authorities have concluded that there is absence of alternative solutions)</u>
The following is a summary of the main problems that have emerged during the analysis of the alternative proposals, in order to identify the best solution that would minimise the interferences with the Natura 2000 Network.
Alternative 1: the main environmental issues concern the crossing of two Natura 200 sites, ZSC IT1160067 Vallone D'Arma and ZPS IT1160062 Alte Valli Stura e Maira, of which the second is directly involved in this project. This site is affected with the direct and indirect impacts of the excavations and earth moving, as well as the storage and transportation of large quantities of extracted materials, at the front of the work advancement (entrances) and the open air work areas.

The transition area between the two tunnels is particularly delicate, the area with the viaduct that crosses the Cant Stream, where the erosion of the river has created subvertical embankments and unstable areas, defined as active landslide areas.
We must bear in mind that, even if it is not a factor connected with the Natura 2000 Sites, the last issue dictated by the type of project that provides for tunnels on over 90% of its extension is the cost, suggesting that this alternative will be very costly, with an estimate over 97 M€. The cost vs benefits analysis, carried out during the final planning phase, highlighted that this alternative does not reach the economic sustainability, or the convenience for the community, because the costs are significantly higher than those of Alternative 5.
In conclusion, the proposed solution shows possible impacts on the ZPS IT1160062 Alte Valli Stura e Maira, and although the type of construction allows the project to involve only specific areas built in open air, it also involves a particularly delicate section of the Cant Stream, with possible important interferences on the ecological functions of this corridor.
Alternative 2: the main environmental issues are concerned with the crossing of the ZSC/ZPS IT1160036 Stura di Demonte, where the nodal points of the Stura Stream are involved, that are characterized by higher sensitivity levels and environmental adequacy of this site, crossed by long sections in the viaduct. The foreseeable direct impacts are due mainly to the excavation and earthworks for the deep foundations and the sections that are in trenches, with the interference on the left and right banks of the Stura.
The hydraulic and hydro-geomorphological aspects are particularly delicate, due to the diffusion of flood conditions and instability that were discovered along the streams.
In conclusion, the proposed solution presents considerable impacts on the ZSC/ZPS IT1160036 Stura di Demonte area, because of the provided localisation and construction types, that determine direct impacts on the most sensitive and important conservation areas of this Site, during the construction and active phases.
Alternative 3: this alternative bypasses the town centre of Demonte, and goes through the Stura Valley mainly on the right bank of the river.
The problems connected to the current geometry of this route and its orographic position, which is mainly between the embankment on the left and the Stura stream on the right, are connected to the excavations and earthworks during the route preparation, that fall directly on a long section of the ZSC/ZPS IT1160036 Stura di Demonte, with particular issues in the areas close to the Stura stream, in the Ospitalieri and Fontan locations.
The hydraulic and hydro-geomorphological aspects are particularly delicate, due to the diffusion of flood conditions and instability that were discovered along the streams.
In conclusion, the proposed solution presents several possible impacts on the ZSC/ZPS IT1160036 Stura di Demonte, because of its location and the nature of the intervention that requires the adjustment of the whole length of the existing road. Although the route goes along the perimeter of the Site, there are areas of possible impact concerning the Stura di Demonte stream, with direct impacts on the most sensitive and important conservation areas of the site.
Alternative 5: this alternative represents the solution with the smallest construction impact compared to the major art works that must be built, creating less problems during the realisation phase.
The main environmental issues are concerned with the crossing of the ZSC/ZPS IT1160036 Stura di Demonte areas. This site is crossed for approximately 1.800 metres in a marginal position, to the north compared to the more sensitive and environmentally suitable areas localised next to the Stura Stream. Direct impacts can be expected, mainly

due to the excavations and earthworks, close to the embankments that must be created in open spaces (meadows) and the trapezoid re-geometrization of a short section of an existing ditch that is located close to the Stura Stream.
The current hydro-geomorphological conditions must be protected close to the Cant stream, but they are smaller than those highlighted for the other solutions, where the conditions of instability are more widespread or important.
In conclusion, the proposed solution can have possible impacts on the ZSC/ZPS IT1160036 Stura di Demonte, but the localisation of the works and the types of construction make it possible to restrict the impacts on specific areas, that are far from the most significant nodes of the Site. The only exception is represented by the collection pipes for the drainage waters of the road platform, that require the renovation of an existing ditch at the end section, that is located in a small riparian area of the Stura. Possible impacts on the meadow habitats can be restricted and limited, even non-significant, if compensatory solutions are adopted.

Alternative 5 has been chosen as the most adequate, after analysing the elements that were identified by the different alternatives and assessing the main issues of each of them, and after assessing the possibility of intervening with compensatory solutions for the effects that could be created on the Natura 2000 Sites.
In conclusion, after examining and assessing all the possible alternative solutions for this project, including option 'zero', we confirm that the best possible solution is Alternative 5.

4. IMPERATIVE REASONS OF OVERRIDING PUBLIC INTEREST

Reasons to carry out this plan or project in spite of its negative effects

- □ Imperative reasons of overriding public interest, including those of a social or economic nature (in the absence of priority habitats/species)
- □ human health
- □ public safety
- □ beneficial consequences of primary importance for the environment
- X other imperative reasons of overriding public interest

Description and justification of the reasons and why they are overriding[2]:

The Official deeds and IROPI compliance declarations are attached to this document, named "Attestazione dei Motivi Imperativi di Rilevante Interesse Pubblico (IROPI) (Certificate of compliance of relevant important public interest reasons)".

In summary, the attached documents, of legal, technical and administrative nature, that demonstrate the relevant public interest of this intervention are:

- Deliberation n. 65/2017 of the Interministerial Committee for Financial Programming, to Approve the «Contract design for the program of 2016-2020» between the Infrastructures and Transportation Ministry and Anas S.p.a. and the subsequent update approved by Deliberation CIPE n.36 dated 24.07.2019 (G.U. n. 20 dated 25.01.2020), which became final with the Interministerial Decree MIT - MEF n.399 del 17.09.2020;
- Long term plan of investments, that defines the investments based on the State funding plan and EU Community based funding, through many programming instruments, of which the «Programmed Contract» between Anas and the Infrastructures and Transportation Ministry;
- Programmed Contract, or the instrument that allocates public resources to Anas, for the realisation of the interventions in the infrastructures that are considered prioritary and of relevant public interest as defined and programmed in the Piano Pluriennale degli investimenti(Long term investment plan).

These attached documents illustrate that the Investment Program connected to the Program Contract 2016-2020 is the result of a thorough project review activity adopted by the Infrastructures and Transportation Ministry and Anas, and that is the result of a renewed valorisation view for the infrastructure network, geared to enhance the safety, functionality and comfort standards, and to shorten the realisation delays, using the least possible environmental and financial resources.

The roadway S.S. 21 'della Maddalena' is an important main traffic route for the Transalpine area, and not only is it concerned with local traffic of the Stura Valley, but it is also characterized by intense commercial and tourist traffic, with the important presence of heavy vehicles. The main objective of this intervention is to divert the important heavy vehicle traffic volume from the urban area and its relative historical centre, by creating a bypass of the town centre.

The main drivers of the project review activities who have lead to the insertion of this intervention in the Investment Plan and thus the Agreement with Program 2016-2020

[2] Different level of detail may be required depending on whether the notification is submitted for information or for opinion.

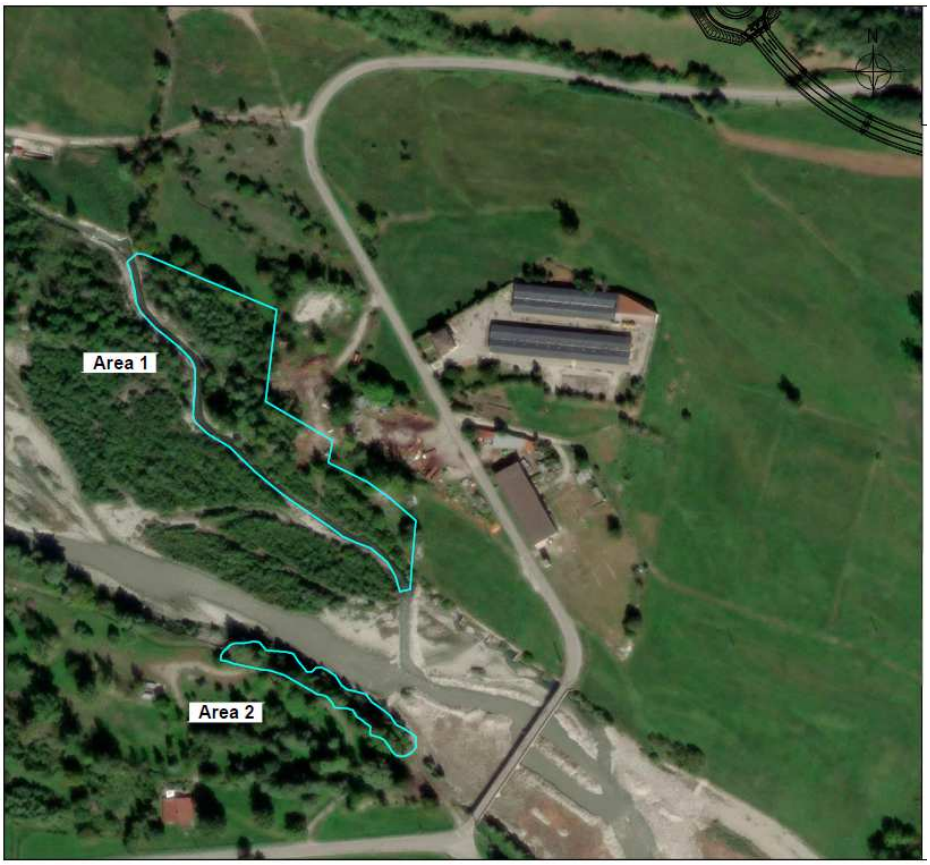
have been concerned with the sustainability in terms of "social consensus", functionality in terms of "safety" and the valorisation in terms of "social and financial development".
The creation of this variant will be followed by a "decongestion of the roadways" on the existing route that crosses the town centre of Demonte, so the itinerary of the current road S.S. 21 will be significantly enhanced in its functional quality, with a consequential use of the urban artery for reasons more coherent with its nature, and that will also promote the value of its historical and panoramic nature as well as a clear improvement in terms of "safety", "social consensus" and "social and economic development".

5. COMPENSATORY MEASURES[3]

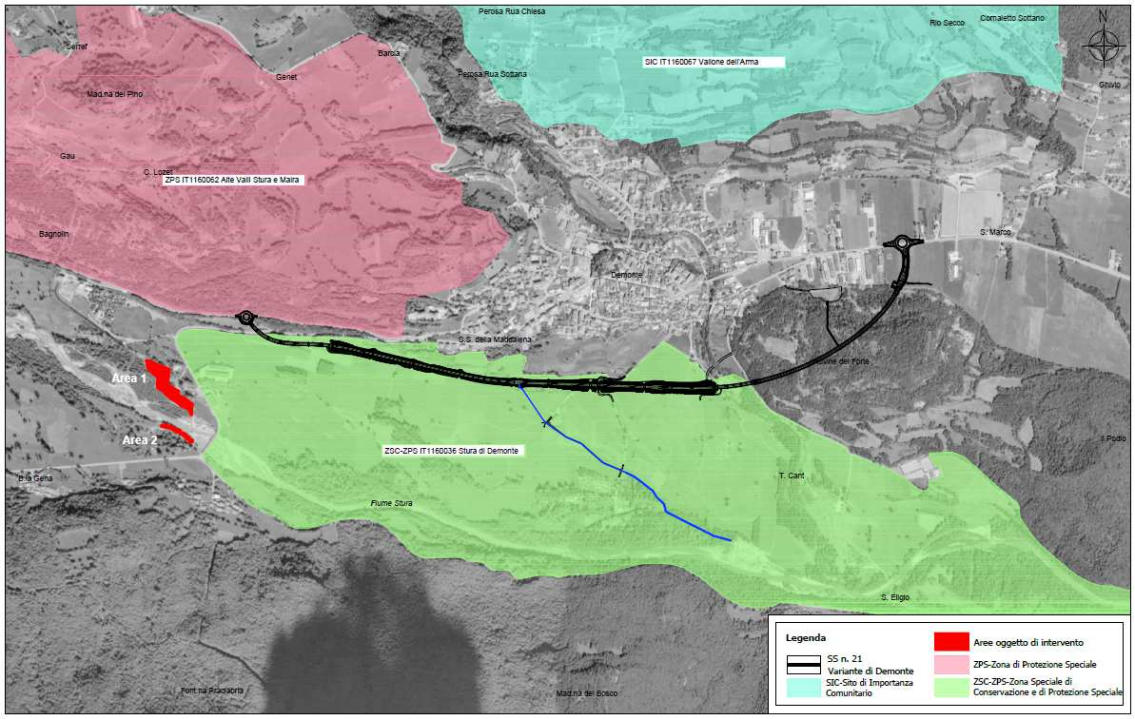
Objectives, target features (habitats and species) and ecological processes/functions to be compensated (reasons, why these measures are suitable to compensate the negative effects)

For the definition of the compensatory measures, we have considered the objective of restoring all the areas removed from Habitat 91E0* during the construction phase, re-establishing the adequate conditions to recreate the structure (vertical stratification of the vegetation) and subsequently re-establishing its environmental functions.
An intervention to strengthen the ecological corridor represented by the Cant stream will be realised, with the creation of a riparian vegetation band next to the Cant Viaduct, as well as the restoration of the Habitat 91E0* removed during the worksite phase. In this zone the riparian band is actually rarefied and discontinued, as the tree and shrub coverage is missing in certain places. As highlighted in the assessment of the impacts related to the fragmentation phenomenon, in the upstream section of the Natura 2000 site where the Viaduct will be built, the riparian band of the Cant stream, although presenting several patches of Habitat 91E0*, is actually absent or thinned, thus defining an ecological discontinuity.
Two additional areas have been identified along the Cant stream ecological corridor in which to improve and maintain or form new nuclei in habitat 91E0*, reinforcing the riparian belt. These areas have been located outside the scope of the project and can be created before the construction phase begins.

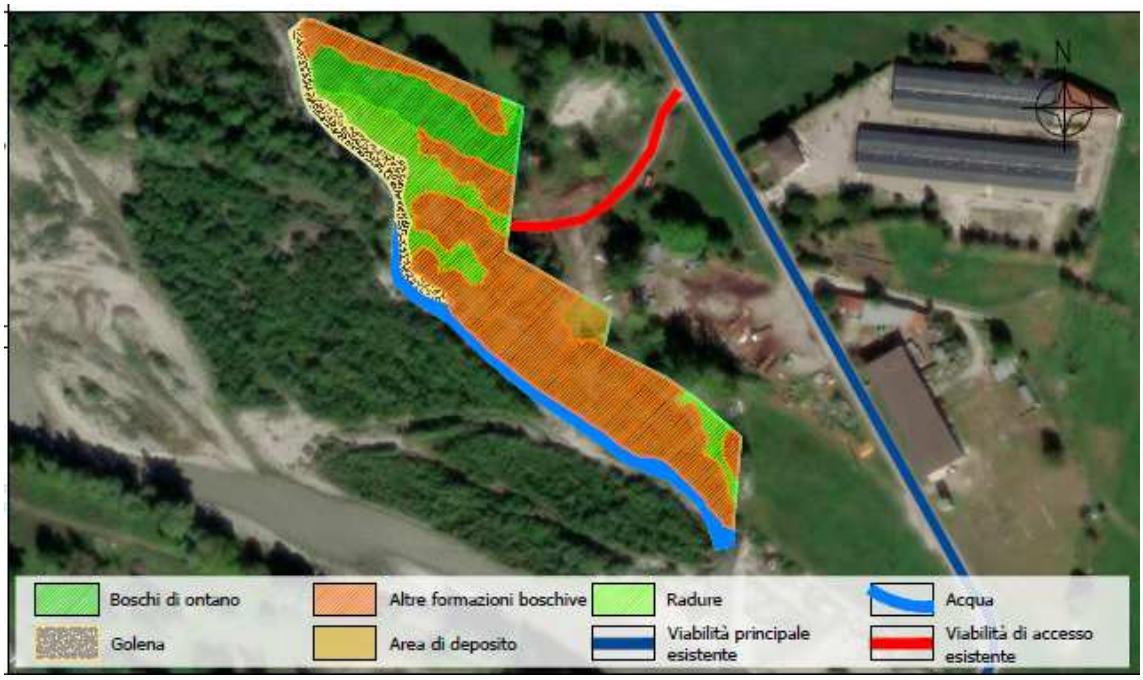
[3] Different level of detail may be required depending on whether the notification is submitted for information or for opinion.



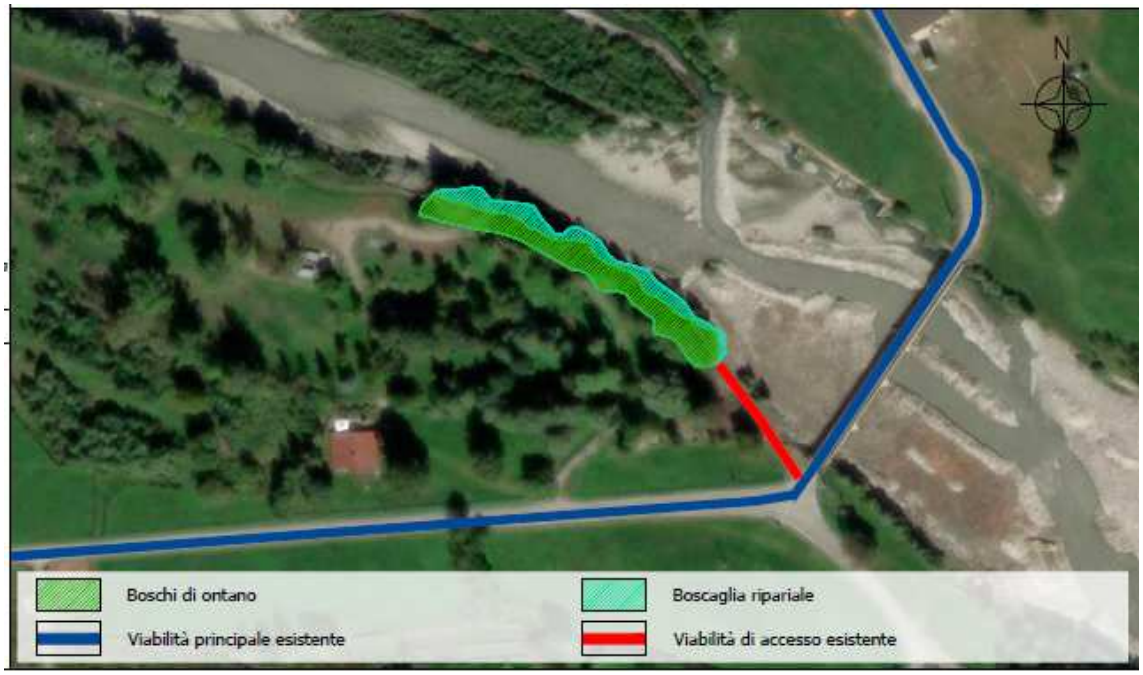
Location of the two areas for compensation, outside the site



General framework of the project with respect to the sites of the Natura 2000 network



Survey – intervention area 1



Survey – intervention area 2

Concerning the vegetation potential of this area that presents adequate ecological conditions to host Habitat 91E0*, we have planned the plantation of plants species to compose a tree vegetation band that will be colonised by the typical grasses and shrubs species of the flora species of the Habitat in just a few years.

Extent of the compensatory measures (surface areas, population numbers)

The following is a report of the areas removed and object of restoration, inside and outside of the SAC-ZPS area.

Cod. Habitat Natura 2000	A	E	F	G	H	I	L	D
	Habitat area	area inside the SAC/SPA			area outside the SAC/SPA			total compensated area Habitat 91E0*
		temporary removal	permanent removal	compensated surface	temporary removal	permanent removal	compensated area	
91E0*	ha	m2	m2	m2	m2	m2	m2	m2
	78.66	1,420	0	7,945	520	0	9,656.83	17.601.83
		% E/A	% F/A	G:E	% H/A	% I/A	L:H	D:(E+H)
		0.18%	0%	**5:1**	0.07%	0%	**9:1**	**9:1**

Specifically:
- an extension of the site equal to 18,166.50 m2 is planned;
-inside the SAC/SPA area we plan for the restoration of 1420 m2 of Habitat 91E0* (equal to approximately 100 % of the removed area);
-outside the SAC/SPA area we plan for the improvement of a surface of Habitat 91E0* equal to 2,496.55 m2;

- outside the SAC/SPA we plan the establishment of new habitat areas 91E0*, equal to approximately 7,160.28 m2;
- it is therefore possible to conclude that, for Habitat 91E0*, the total compensated and/or improved surfaces of the outside of the site corresponds 17,601.83 m2, equal to 9 times the subtracted area of the same habitat, as illustrated in the following table.

	B	C	D
cod. Habitat Natura 2000	removal and compensated	new created area	total compensated area Habitat 91E0*
91E0*	m2	m2	m2
	1,940	7,106.28	17,601.83
			rapporto D:B
			9:1

Proposal to expand the SN2000

The adopted compensatory measure will be realised by re-establishing, reinforcing ancd increasing the ante-opera conditions of Habitat 91E0* and will balance the temporary interruption of ecological processes caused by interference with the habitat.
As explained in the following points, the proposed measure is considered efficient for the restoration of the structure and functionality of the Habitat, bearing in mind the temporary nature of the pressure of the intervention for the infrastructure, of the condition of the vegetal community that needs to be restored, the type of Habitat to be restored, the state of conservation and the ecological conditions of the involved areas.
What's more, the proposed measure can be implemented earlier than the start of the construction phase, before the impact occurs.

<u>Identification and location of compensation areas (including maps)</u>
The areas involved in the restoration are those that involve Habitat 91E0* during the construction phases, specifically:
- temporary occupation to adjust the existing soil ditch near the Stura di Demonte stream;
- temporary occupation to build the east embankment of the Cant viaduct;
- temporary occupation to install the temporary Bailey type bridge.
The areas covered by the establishment of new habitat area 91E0* are located:
- on the hydraulic left of the Cant Stream, outside the project scope, on areas mainly occupied by uncultivated areas and deciduous plants cultivation;
- on the hydraulic right of the Cant stream, near the Cant Viaduct, on areas mainly occupied by impoverished fertilized areas and invading communities of Fraxinus sp.
The localisation of the areas in which the compensatory measures will be carried out are reported in the attachment "Carta degli interventi di compensazione - habitat 91E0*" (Intervention map for the compensatory measures- habitat 91E0) cod. T00IA02AMBPP01B.
The pressure on the Habitat will end at the end of the intervention, allowing the complete return of the functions thanks to the compensatory measures.

In the area outside the project scope, we have provided for the the implementation of the compensation measure before the start of the construction phase, before the impact occurs. This area, close to the one interfered by the project, will balance the negative impact, immediately offering structures and functions similar to those temporarily subtracted.

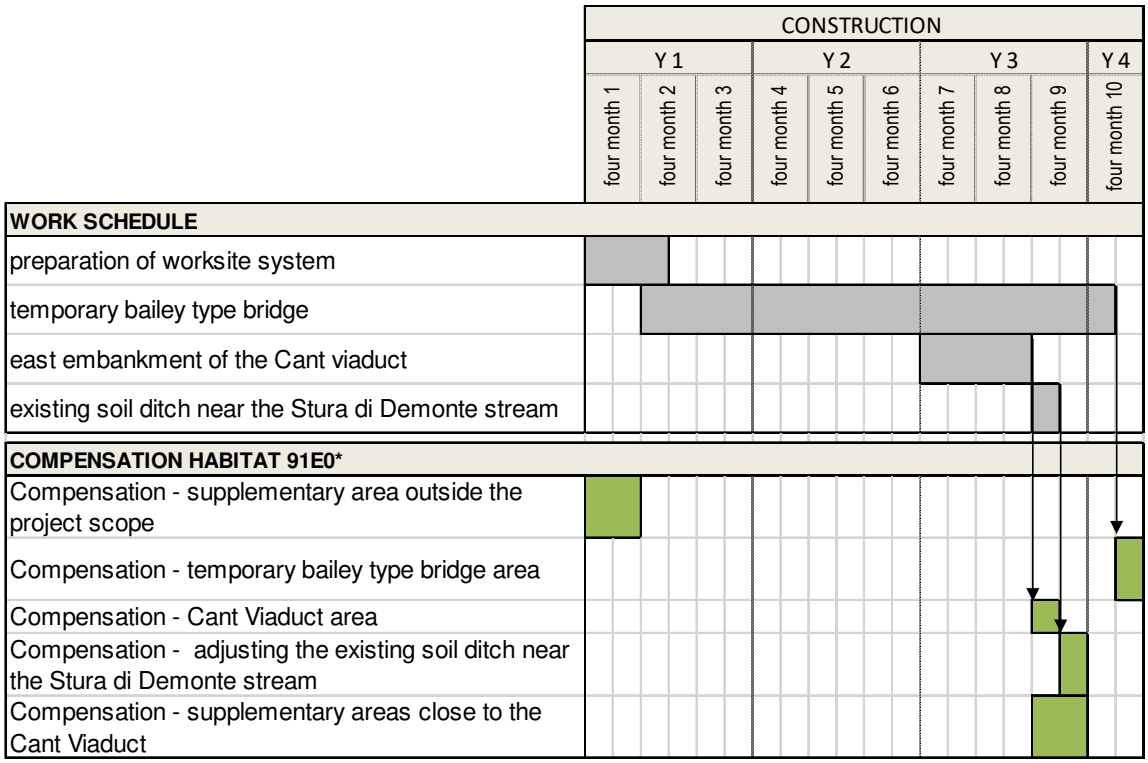
Former status and conditions in the compensation areas (existing habitats and their status, type of land, existing land uses, etc.)
The phytocoenosis of Habitat 91E0*, along the Cant stream, presents a small extension, as it is only located in a tight discontinued band; along the Stura di Demonte river these formations present themselves in larger areas and in excellent state of conservation. Groups of *Alnus glutinosa* can also be found, in the area under scrutiny on the river terrace, in a more external position, in areas in which floods occur less frequently, which in the surveyed area can be found in a mosaic that penetrates the formations with a predominance of *Salix alba*. Considering the maturity of these phytocoenosis, they are by nature azonal and they last a very long time, as they are conditioned by the level of the stratum and by the cyclical dry and wet periods.

Expected results and explanation of how the proposed measures will compensate the adverse effects on the integrity of the site and will allow preserving the coherence of the Natura 2000 network
With the compensatory measures we can expect the complete restoration of the structures and functions of the Habitat of all the removed surfaces, re-establishing the conformation of the vertical stratification and consequently the relative ecological functions and incrementing the extent of the habitat area within the Natura 2000 Site.

Along the Stura di Demonte River, the planned compensatory measures will be created inside the extended formations that are in excellent state of conservation. These conditions allow the rapid restoration of the ante-opera situation, fully compensating the negative effects on the integrity of the habitat.
What's more, the compensatory measures will allow the reinforcement of the ecological corridor of the Cant stream compared to the current situation, thanks to the reconstruction of the riparian band in the areas where there is currently very little and discontinued or absent vegetation, with a significant increase in the surface area of the Habitat.
So, in relation to the suitability of the areas involved by the restoration of Habitat 91E0*, we can foresee that in just a few years following the plantation of the tree species, the restored areas will be colonised by grass and shrub species that are typical flora of Habitat 91E0*.

Time schedule for the implementation of the compensatory measures (including long-term implementation), indicating when the expected results will be achieved.
In order to define the timing of the implementation of the compensatory measures, the elements evaluated are location of the areas and the overlap with the worksites.
For the restorations in the areas interfered by the worksites, we will necessarily wait for the end of the specific construction phases. In these areas, we expect the resumption and strengthening of ecological processes at the end of the specific construction phases.
On the two supplementary compensatory areas close to the viaduct Cant, we will operate simultaneously with the restoration of the areas subtracted from the viaduct and we expect to amplify the vegetative restart in the interfered areas.

On the supplementary compensatory area outside the project scope, we will work during the preparation of the worksites, before the construction.
Below, a summary report with the implementation times of the compensatory measures with the work schedule:



In order to guarantee efficient rooting and limit the stress of the plantation, this work will be carried out during the vegetative rest period, not before the month of October. What's more, in order to limit the disturbance to the local wildlife and mainly the nesting avifauna, the work for the realisation of the road S.S. 21 Lot 1 Variant of Demonte, in correspondence with the involved area of Habitat 91E0* , will be carried out in the shortest time possible, and by stopping the noisy work at sunset.
In the following table there is a chart with the preferred realisation periods for the compensatory measures.

Gantt Diagram with the preferred periods for the realisation of the compensatory measures.

	September	October	November	December	January	February	March
Tree planting							

Best period
Possible period

Methods and techniques proposed for the implementation of the compensatory measures, evaluation of their feasibility and possible effectiveness

Area 1. The interventions consist of forest restoration actions to be carried out where wooded areas are absent, or forest improvement actions to be envisaged as formations

dominated by Alnus incana and Fraxinus excelsior subsp. excelsior and other types of forest.
In general terms, the objectives and purposes of the compensation interventions envisaged in Area 1 are:

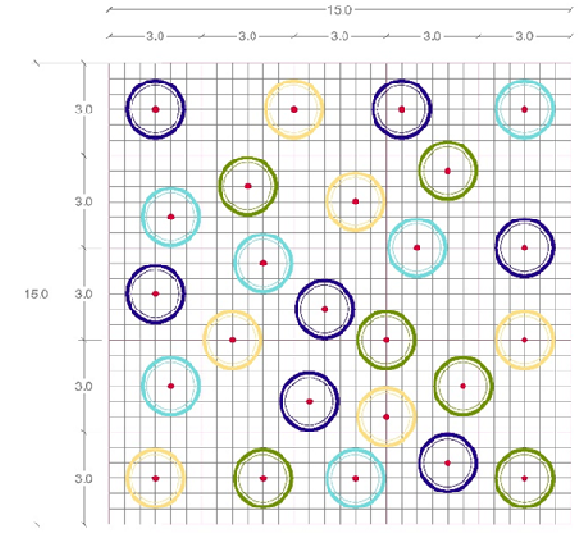
- Reconstruction of the vegetation structure of the habitat;
- Reduction of forest fragmentation and its effects;
- Prevention and containing of invasions by exotic species;
- Restoration of the forest surface;
- Dissemination of practices compatible with the conservation of the habitat.

Forest restoration interventions

The restoration actions consist of:

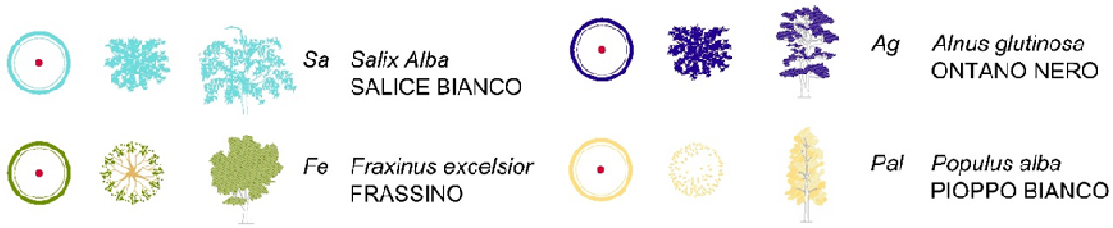
- Elimination of invasive species (Urtica dioica, Rubus caesius);
- Elimination of alien species from grassland tiles;
- Outlining the reforestation scheme on the ground;
- Planting layout of 15.00 m x 15.00 m;
- Use of juvenile specimens or seedlings originating from local forest nurseries;
- Pioneer species, such as Salix purpurea and Salix eleagnos, can be used in the belt closest to the Stura river, especially on pebbly and soilless substrates;
- Monitoring and rapid eradication of unwanted species (non-native, domestic).

Below is the chart of the plantation pattern proposed for the Habitat 91E0* restoration operations.



SESTO	SPECIE	INCIDENZA Unità / mq
A.A	*Fraxinus Excelsior*	0.03
	Salix Alba	0.03
	Populus Alba	0.03
	Alnus Glutinosa	0.03

Specie e numero di piante presenti in 225 mq



Forest improvement interventions

The following general operations are to be included in correspondence with Area 1 and, specifically, the alder woods and other woodland formations:

- Monitoring of populations of non-native species not yet reported, especially in the early stages of the intervention;
- Maintaining the standing dead trees;
- Favouring the conversion to high forest or mixed management;
- Thinning of plants belonging to the dominant plane in case of high density;
- Healing of any existing or pre-existing clearings with the placement of Alnus incana and Fraxinus excelsior subsp. excelsior specimens;
- Timber must be chopped and stacked in the woods, or an assessment must be made as to whether to leave the brushwood in small stacks or to shred them with a forestry mulcher or chipper;
- The felling of large diameter plants in the woods must be carried out in such a way as to cause the least possible damage to the existing topsoil and in any case must only concern species not coherent with the context, evaluating the relationship between the benefits and possible damage.

Area 2. In general terms, the maintenance interventions planned in correspondence with Area 2 are:

- Control and management of invasive species,
- Phytosanitary control,
- Pruning interventions aimed exclusively at diseased and withered individuals/branches,
- Monitoring and rapid eradication of unwanted species (non-native, domestic).

Costs and financing of the proposed compensatory measures

The cost for the compensatory measures has been estimated at 97,000 €.

The infrastructure intervention of the road S.S. 21 Lot 1 Variante di Demonte, which is involved in the compensatory measures, comes to an overall amount of 89.26 M€ and is partially financed by 6.6 million euro from the Program Contract 2014 for 0.35 M€, by the Program Contract MIT-Anas 2016–2020 for an amount of 0.42 M€ from the Fondo Unico Anas and from the Fondo Infrastrutture 2017 for an amount of 5.83 M€.

Responsibilities for the implementation of compensatory measures

The actuator and person responsible for the compensatory measures is the proponent of the intervention on the infrastructures of the road S.S. 21 Lot 1 Variante di Demonte, Anas spa.

Monitoring of the compensatory measures, where envisaged (e.g. if there are uncertainties concerning the effectiveness of the measures), assessment of results and follow-up

The monitoring protocol involves carrying out the following activities:

- phyto-sociological studies (Braun-Blanquet method), intended to define and characterise the vegetation associations with the recognition of the physiognomic combination of reference for Habitat 91E0*, in order to obtain the full recuperation of the structures and composition of the Habitat;
- flora study, in order to define the variations of the typical composition of Habitat 91E0*, defined with the infiltration of invasive exotic species, synanthropic and urban, that indicate a disturbance;

- return of the vegetation maps to the involved area, with a quantitative estimate of the area of Habitat 91E0* in the intervention areas, in order to monitor the evolution of the intervention required to restore and return the complete functions of the Habitat.

The activities will be carried out on all the areas subject to compensation, according to the times of implementation of the measures.

The following is a summary chart of the planned activities for the AO, CO and PO phases, in all areas that will be involved in the compensatory measures:

<table>
<tr><th>Phase</th><th>Duration of the phase</th><th>Parameters</th><th>Frequency</th><th>N. of campaigns</th></tr>
<tr><td>AO
before implementing the compensation</td><td>1 year</td><td rowspan="2">Characterisation, extension, structures and trends of the existing phytocoenosis</td><td>2 seasonal (spring and autumn)</td><td>2</td></tr>
<tr><td rowspan="2">CO
while implementing the compensation</td><td rowspan="2">3 years</td><td>2 per year, seasonal (spring and autumn)</td><td>6</td></tr>
<tr><td>Characterisation, extension, structures and trends of the phytocoenosis to verify the evolution of the restoration/reconstruction intervention for Habitat 91E0*</td><td rowspan="2">2 per year, seasonal (spring and autumn)</td><td rowspan="2">16</td></tr>
<tr><td>PO
after implementing the compensation</td><td>8 years</td><td>Study of the composition of Habitat 91E0* in correspondence with the areas involved in the restoration/reconstruction</td></tr>
</table>