Iniziativa

Continuum Ecologico

CATALOGO DELLE POSSIBILI MISURE PER L'OTTIMIZZAZIONE DELLE RETI ECOLOGICHE NELLE ALPI

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L'Iniziativa Continuum Ecologico: Natura senza confini

L'Iniziativa Continuum Ecologico persegue l'obbiettivo della salvaguardia o del recupero della connettività ecologica nelle Alpi promuovendo e incoraggiando progetti e proposte rilevanti in questo settore. I partner dell'Iniziativa (la Rete delle Aree Protette Alpine, ALPARC; la Commissione Internazionale per la Protezione delle Alpi, CIPRA; e il Comitato scientifico per la ricerca nelle Alpi, ISCAR) svolgono un ruolo di collegamento tra ambiti politici, non governativi e scientifici per la condivisione e lo scambio di conoscenze, informazioni e buone pratiche. I partner collaborano col WWF Programma europeo delle Alpi.

Il lavoro dell'Iniziativa Continuum Ecologico è sostenuto dalla Fondazione MAVA per la Natura, un ente privato svizzero. Il catalogo delle misure è anche stato finanziato dall'Ufficio federale tedesco per la protezione della natura con fondi del Ministero federale dell'ambiente, della conservazione della natura e della sicurezza nucleare e dal Ministero francese dell'ecologia, dell'energia, dello sviluppo sostenibile e del mare.

INHALT

I INTRODUZIONE

Al lungo andare le aree protette non possono da sole conservare la biodiversità nelle Alpi. Piuttosto è necessaria un'azione ecosostenibile su tutto il territorio, anche e soprattutto al di fuori delle aree protette. Misure mirate e programmi di incentivo contribuiscono alla realizzazione di una rete ecologica aiutando la connessione tra habitat e zone protette.

"L'Iniziativa Continuum Ecologico" ha realizzato il catalogo delle misure per sostenere le attività finalizzate alla realizzazione di una rete ecologica nelle Alpi in sette regioni pilota. Tale catalogo, tuttavia, vuole essere anche un aiuto per tutte quelle regioni e quegli attori, nelle Alpi e altrove, che si impegnano per il miglioramento della connessione ecologica.

Una miniera di azioni e di esempi

Nel "Catalogo delle possibili misure per l'ottimizzazione delle reti ecologiche nelle Alpi" troverai informazioni su una vasta gamma di possibili azioni nella natura che possono migliorare la capacità di funzionamento delle reti ecologiche.

Presenteremo esempi, provenienti da diversi Stati alpini, di come superfici e strutture possano essere create, conservate o riparate in modo da poter fungere da elementi di connessione di una rete ecologica. E' importante da questo punto di vista che le singole misure contribuiscano ad una messa in rete di ampio respiro del biotopo, essendo realizzate su superfici con alta valenza di connessione o per specie determinate.

Attualmente 71 singole misure sono descritte nelle schede e valutate secondo diversi criteri sociali, tecnici, ecologici ed economici. Le indicazioni fungono da punti di riferimento: per la realizzazione concreta e la pianificazione delle misure sono necessarie ulteriori ricerche. Le singole misure sono richiamabili in maniera interattiva su http://www.alpine-ecological-network.org/information-services/measure-catalogue-it. Puoi effettuare una selezione individuale di misure che corrisponde ai criteri di tuo interesse.

Le misure selezionate che appaiono particolarmente interessanti per l'approccio innovativo, l'originalità o la realizzazione esemplare, sono descritte in maniera più dettagliata sulla base di esempi o di progetti concreti. Tali esempi di applicazione ti daranno un forte incitamento, ma anche informazioni pratiche come contatti e referenze.

Prima di mettere in pratica una delle misure presentate, devi verificare se essa coincide con le finalità, stabilite su base locale, della rete del biotopo.

In determinate circostanze sono necessari adattamenti alle condizioni locali. Per l'applicazione delle misure presentate sono di grande importanza molti settori e ambiti diversi.

Condividi le tue esperienze con gli altri

Mediante un modulo su http://www.alpine-ecological-network.org/information-services/measure-catalogue-it, tutti gli utenti del sito internet possono inserire, come esempi, le esperienze pratiche acquisite in regioni pilota o altrove nelle Alpi, in modo da renderle accessibili al pubblico interessato. Saremo ben lieti di ricevere esempi o informazioni integrative sulla descrizione delle misure (aurelia.ullrich@cipra.org).

Altre annotazioni sulle valutazioni

Le valutazioni sono state acquisite per lo più sulla base di informazioni accessibili, che in parte rispecchiano le esperienze di singoli progetti. Si tratta pertanto di indicazioni molto semplificate che possono servire da punti di riferimento.

Alle categorie “efficacia ecologica“ ed “effetti socio-economici” sono associati i quattro livelli di valutazione “alto”, “medio”, “scarso” e “nessun effetto diretto”. In relazione alla “efficacia ecologica“ la scala è organizzata in questo modo: più gli effetti positivi della misura sulla biodiversità e soprattutto sulla rete ecologica sono documentati da ricerche scientifiche e progetti, più alto è il valore attribuito all’effetto della misura. E viceversa l’effetto è stato considerato scarso quando non è riscontrabile quasi nessun riscontro.

Anche a livello economico, un effetto considerato elevato corrisponde ad una misura con possibilità di ritorno economico o risparmio e viceversa. Complessivamente, sotto “effetti socio-economici” sono stati considerati sia gli effetti positivi diretti che gli effetti indiretti, p. es. la creazione di posti di lavoro o la possibilità di contribuire allo sviluppo regionale.

Proprio a livello di criterio “effetti socio-economici“ va considerato che si tratta di una valutazione di massima, in parte basata su singoli progetti. In questo senso la situazione può variare notevolmente da caso a caso. Spesso è stato difficile anche determinare i costi. Ciò è essenzialmente dovuto al fatto che i costi concreti per tutte le misure sono molto variabili, dipendono cioè fortemente da diversi fattori. Fattori quali la situazione di partenza, la dimensione del territorio e le condizioni specifiche delle singole superfici, infatti, hanno un ruolo importante. Queste valutazioni rappresentano perciò delle stime molto approssimative che non sono da ritenersi vincolanti.

La situazione è molto simile anche per l’efficacia ecologica, che dipende ancora dalle condizioni di partenza concrete e trae origine dal fatto se la misura si inserisce o meno nel rispettivo contesto e se è stata pianificata ed attuata con accuratezza e regionalizzata di caso in caso. La valutazione nella Tabella fornisce semplicemente un’indicazione di massima ma, nella fase di attuazione concreta, può risultare diversa.

II I FONDAMENTI LEGALI

L’importanza delle reti ecologiche per la tutela della biodiversità alpina si rispecchia in numerose legislazioni, da quelle internazionali a quelle regionali. I fondamenti per una rete ecologica alpina sono in particolare la Convenzione sulla diversità biologica (CBD), Natura 2000 e la Convenzione delle Alpi. Il quadro stabilito a livello europeo viene gradualmente realizzato anche sul piano nazionale e subnazionale. A questo scopo si sviluppano strumenti individuali adattabili alle rispettive condizioni ed esigenze locali. Così, negli ultimi anni, un numero sempre crescente di paesi europei ha varato legislazioni nazionali in riferimento alla connessione ecologica nella natura. Ciò dimostra l’importanza che viene attribuita al mantenimento delle reti ecologiche per la tutela a lungo termine della diversità biologica.

Convenzione delle Alpi

La Convenzione delle Alpi è una convenzione quadro degli otto paesi alpini: Germania, Francia, Italia, Austria, Slovenia, Principato di Monaco, Svizzera, Principato di Liechtenstein e Unione Europea, per la protezione e lo sviluppo sostenibile della regione alpina.

L'articolo 12 del Protocollo "Protezione della natura e tutela del paesaggio" della Convenzione delle Alpi promuove la creazione di una "rete nazionale e transfrontaliera di aree protette, biotopi e altri beni ambientali o meritevoli di protezione riconosciuti."

La messa in rete delle aree protette è stata coerentemente inserita nel Programma di lavoro pluriennale 2005-2010 della Conferenza delle Alpi. Nell'ambito del tema focale "Natura, economia agricola e forestale, paesaggio rurale" uno degli elementi più importanti è la conservazione di paesaggi, habitat e specie. Come misura mirata è citata in esso anche la rete dei biotopi. Altre misure per la costituzione di una rete transfrontaliera di zone protette e il suo collegamento con altre strutture ecologicamente significative sono indicate come priorità per il futuro lavoro della Conferenza delle Alpi (PLP, punto 2.4.).

La Piattaforma permetterà lo scambio di informazioni su misure e metodologie, il loro sviluppo e il confronto tra gli stati alpini. La Piattaforma che riunisce rappresentanti ufficiali dei paesi alpini, ma anche esperti, gestori di aree protette e membri di enti alpini, fornisce anche un collegamento importante tra mondo politico, comunità scientifica e organizzazioni ambientaliste, oltre a facilitare la collaborazione con altri settori. Nell’ambito della Piattaforma gli esperti sono attivi in tre campi specifici: accompagnamento scientifico per la creazione di una rete ecologica, attuazione di progetti, comunicazione e sensibilizzazione dell’opinione pubblica.

Convenzione delle Alpi: www.alpconv.org, Piattaforma Rete ecologica: www.alpine-ecological-network.org/platform

Natura 2000

Il principale obiettivo di Natura 2000 è la tutela sul territorio della UE di una rete coerente di habitat e specie caratteristiche. In questo modo Natura 2000 supporta gli obiettivi di una connessione coerente e funzionale di habitat e biotopi. Nella Direttiva FFH, infatti, gli Stati membro sono invitati a promuovere "elementi paesaggistici di continuità" atti a migliorare la coerenza ecologica della rete di aree protette Natura 2000 (articoli 3 e 10). Questo non significa un impegno ad istituire nuove aree protette, ma – aldilà delle aree Natura 2000 – l'invito è rivolto alla predisposizione di altri elementi di connessione nella pianificazione paesaggistica.
Natura 2000 è basata sulle Direttive "Flora-Fauna-Habitat" (Direttiva FFH 92/43/CEE) e "Uccelli" (79/409/CEE). La rete di aree protette a livello dell'UE è a servizio della conservazione del patrimonio naturale europeo in tutta la sua diversità. Oltre a ciò Natura 2000 punta ad uno stato di conservazione favorevole delle tipologie di habitat e delle specie di importanza comunitaria, indicate negli allegati delle due Direttive. Per garantirne la rappresentatività sono state delimitate delle regioni biogeografiche di riferimento che si orientano in base ai territori di diffusione delle specie. Insieme ad altre catene montuose europee, l'arco alpino costituisce la regione biogeografica alpina (regioni di alta montagna). Un altro aspetto importante di Natura 2000 in relazione alla rete ecologica è l'impegno di assicurare nel tempo le misure di protezione e di sviluppo necessarie ai fini della conservazione delle specie e degli habitat. Per tutte le aree di interesse comunitario devono essere definite misure per la conservazione delle specie e delle tipologie di habitat della Direttiva che dovranno essere concretizzate nell'ambito di appositi piani di gestione. Un criterio dello stato di conservazione è rappresentato fra altro dalla connessione ecologica.

Natura 2000: http://ec.europa.eu/environment/nature/natura2000/index_en.htm, Direttiva "Flora-Fauna-Habitat": http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm, Direttiva "Uccelli": http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

La Direttiva quadro europea sulle acque

Con la Direttiva quadro sulle acque vigente dal dicembre 2000 (DQA, Direttiva 2000/60/UE), l'Unione Europea ha stabilito obiettivi ambientali validi, in maniera unitaria, in tutti gli Stati membri della UE per la tutela delle acque di falda e delle acque superficiali. Pertanto la Direttiva quadro persegue un approccio ampio, integrato e sovranazionale, che ponga al centro la tutela sostenibile delle risorse e il mantenimento della capacità di funzione ecologica delle acque. Lo scopo principale della DQA è che fiumi, laghi, acque costiere e acque di falda raggiungano un buono stato ecologico entro il 2027.

La Direttiva tiene in particolare considerazione la funzione ecologica delle acque in quanto habitat per diverse specie di flora e fauna. Gli obiettivi di miglioramento della condizione delle acque comprendono anche gli ecosistemi terrestri dipendenti e le loro connessioni. Un ruolo primario spetta inoltre al ripristino della connettività ecologica per gli organismi acquatici e

per il trasporto dei sedimenti in sistemi fluviali sorti in maniera naturale (articolo 4 e appendice V). Solo se esiste tale connettività, ad esempio le specie migratorie come le trote, potranno raggiungere i loro habitat naturali nell'alto corso dei fiumi. Anche per gli invertebrati possono insorgere problemi dall'isolamento di singole parti di corsi d'acqua a causa, ad esempio, di dighe, impianti idroelettrici, bacini artificiali o corsi d'acqua intubati.

Con gli obblighi e gli obiettivi vincolanti dalla DQA, sono predisposti strumenti concreti per la promozione della connessione ecologica in tutte le Alpi. Infatti, con la DQA, gli Stati membri si sono impegnati a ripristinare, laddove possibile, la connettività ecologica di tutti i corsi d'acqua. L'applicazione della DQA richiede tra l'altro misure mirate al miglioramento delle strutture idriche e della connettività, come ad esempio la costruzione di impianti di risalita per i pesci o di gore negli impianti idroelettrici e nelle dighe o lo smantellamento di tubature e di dirupi.

Direttiva quadro sulle acque vigente:
http://europa.eu/legislation_summaries/agriculture/environment/l28002b_it.htm

Legislazioni nazionali

Austria: Focalizzazione sui passaggi della fauna selvatica

Il Ministero federale per i trasporti, l'innovazione e la tecnologia (BMVIT) ha avviato una modifica della direttiva "Protezione della selvaggina" (RVS 3.01), la quale prevede che, nella pianificazione dei trasporti e nella progettazione concreta delle strade nonché nelle verifiche d'impatto ambientale, si tenga conto degli aspetti ecologici riguardanti la fauna selvatica, attenendosi alla direttiva che stabilisce i requisiti minimi delle strade per quanto concerne gli attraversamenti della stessa. La Österreichische Autobahnen und Schnellstrassen GmbH (ÖSAG) ha contribuito alla realizzazione (cfr. SCHWARZEL e altri 2000).

Con l'aiuto dello strumento della pianificazione territoriale ecologica per la fauna (Wildökologische Raumplanung - WÖRP), sviluppato nel 1983 dall'Istituto di ricerca per la fauna e l'ecologia di Vienna, è stato realizzato un progetto basilare di ecologia della fauna selvatica in numerosi Länder austriaci, nonché nel Cantone dei Grigioni in Svizzera e nel Liechtenstein, il cui obiettivo consiste in una permanente integrazione delle specie faunistiche nel paesaggio rurale, raggiungibile mediante l'armonizzazione della messa in rete dei biotopi e le indagini sul patrimonio faunistico. Lo WÖRP contiene una vasta pianificazione territoriale, riferita alla distribuzione territoriale delle popolazioni di animali selvatici (pianificazione basilare nazionale) e una pianificazione dettagliata regionale.

Con il patrocinio dell'ente federale per l'ambiente, sono state redatte per l'Austria liste rosse dei biotopi a rischio.

Francia: rete verde e rete blu “Trame verte et bleue”

La rete verde e blu “Trame verte et bleue” è uno dei grandi progetti nazionali elaborati in Francia nell’ambito dei dibattiti ambientali innescati con la “Grenelle de l’Environnement” nell’ottobre 2007. L’obiettivo dell’iniziativa è quello di prendere decisioni a lungo termine in materia di ambiente e sviluppo sostenibile, in particolare per la difesa della biodiversità. La rete verde e blu è uno strumento di pianificazione territoriale orientato al recupero ecologico del territorio, che viene elaborato in Francia mediante una concertazione tra lo Stato, gli enti locali e un gran numero di attori dalla ricerca scientifica e dal mondo associativo.

Con la rete verde e blu, il concetto di “continuità ecologica” viene introdotto per la prima volta nella legislazione francese. La sua attuazione richiederà diversi anni e rientra nel pacchetto di misure per la tutela della biodiversità previste nell’ambito della legge “Grenelle II”. Questo provvedimento è attualmente in fase di elaborazione e prevede che lo Stato definisca degli orientamenti nazionali, in base ai quali ciascuna regione dovrà elaborare uno schema di rete di collegamento dei biotopi entro la fine del 2012. I comuni dovranno poi tener conto di queste indicazioni regionali nella propria attività di pianificazione.

Anche alcune regioni attuano iniziative a favore delle reti ecologiche. I progetti più avanzati sono quelli delle regioni Nord-Passo di Calais e Alsazia, ma anche Rodano-Alpi, Ile-de-France e Bassa Normandia hanno iniziato a muoversi.

Sin dal 1996, il dipartimento dell’Isère, che comprende molte importanti aree protette, lavora alla creazione di una rete ecologica. Nel 2001, ne è stata realizzata una mappa (REDI) e, da allora, molte sono le attività, intraprese per attuarla (ponti e gallerie, limiti di velocità, pubbliche relazioni, integrazione nei processi di pianificazione) Inoltre, i nove parchi del Massiccio Centrale intendono definire la rete ecologica per garantire un collegamento tra le Alpi e i Pirenei.

La federazione francese dei parchi naturali regionali ha sviluppato un metodo per l’attuazione di reti ecologiche all’interno dei parchi, attualmente testato da parchi come Oise-Pays de France, Scarpe-Escaut, Pilat, Caps et marais d'Opale, Haut Languedoc e Lorraine.

Trame verte et bleue: http://www.legrenelle-environnement.fr/grenelle-environnement/spip.php?rubrique=282, rete ecologica Isère : http://www.pathsoflife.eu, reti ecologiche all’interno dei Massiccio Centrale: http://www.trame-ecologique-massif-central.com/

Germania: legge federale sulla protezione della natura

A partire dalla novellazione della Legge federale sulla protezione della natura (BNatSchG) del marzo 2002, i Länder tedeschi sono obbligati per legge a costituire una rete transregionale di biotopi su almeno il 10% del territorio regionale. L'obiettivo della rete di biotopi secondo il § 3 BnatSchG è la conservazione delle specie locali e dei loro habitat e il mantenimento e rispettivamente il ripristino di interazioni ecologiche funzionanti. Ciò richiede una procedura a tre fasi per individuare le superfici che già danno un contributo alla rete dei biotopi, il fabbisogno di ulteriori superfici adeguate e le superfici adatte a essere sviluppate. A tal scopo si deve tener conto del fatto che le interazioni ecologiche avvengono in aree di dimensioni molto svariate. Per la rete transregionale dei biotopi, prevista dal § 3 BnatSchG, è importante sia il livello internazionale che quello regionale. Tutte le zone, anche quelle che hanno già lo stato di aree protette, sono parti integranti della rete di biotopi soltanto se sono idonee al fine di raggiungere l'obiettivo citato nel § 3, comma 2 BNatSchG. Ne consegue la necessità di sviluppare dei criteri tecnici di scelta per individuare le superfici adatte. Suggerimenti in tal senso sono stati elaborati da un gruppo di esperti provenienti da istituzioni statali e regionali (BURKHARDT e altri, 2004). In applicazione di tali criteri, nell'ambito di un progetto di ricerca, è stato rilevato il patrimonio di superfici significative a livello nazionale per la rete di biotopi (FUCHS e al. 2007). Le aree della cosiddetta "cintura verde" lungo l'ex confine tra le due Germanie sono un importante elemento della rete nazionale di biotopi.

Legge federale sulla protezione della natura: http://www.buzer.de/gesetz/8972/index.htm

La rete dei biotopi e la strategia per la biodiversità della Baviera

Dal 1998 la creazione di una rete di biotopi estesa a tutto il territorio del Land è sancita dalla legge bavarese per la protezione della natura. L'attuazione di tale obiettivo viene perseguita in particolare mediante grandi progetti di protezione della natura. Attraverso diverse centinaia di progetti nell'ambito della rete dei biotopi della Baviera (BayernNetz Natur) vengono creati e curati diversi habitat di pregio per piante e animali rari. I progetti della rete dei biotopi della Baviera sono caratterizzati dalla stretta cooperazione tra i soggetti partecipanti (ad es. agricoltori, autorità, associazioni, comuni). Il sistema si basa sul principio della volontarietà di tutte le misure e su un'impostazione cooperativa. Il finanziamento dei progetti della rete di biotopi della Baviera è assicurato da diversi contributi erogati da Land, Federazione e UE. Altre possibili fonti di finanziamento sono offerte da fondazioni e contratti di sponsorizzazione.
Uno dei quattro obiettivi centrali della "strategia per la biodiversità della Baviera" consiste nel rendere ecologicamente transitabili le barriere che ostacolano gli spostamenti, come le strade e le opere idrauliche che sbarrano i corsi d'acqua. Le aree di superficie maggiore di 100 chilometri quadrati attualmente non attraversate da strade pubbliche e a bassa intensità di traffico rappresentano un elevato valore ecologico che deve essere preservato. Occorre inoltre aumentare la permeabilità ecologica di strade, linee ferroviarie e opere idrauliche trasversali. La strategia per la biodiversità della Baviera viene attuata in accordo con gli altri

settori e coinvolgendo tutti i soggetti interessati, in particolare i diversi fruitori del territorio e i proprietari dei terreni.

BayernNetz Natur: http://www.bayernnetznatur.de, strategia per la biodiversità della Baviera: http://www.stmug.bayern.de/umwelt/naturschutz/biodiversitaet/index.htm

Italia: programmi agro ambientali

In Italia, i programmi di incentivazione dell'agricoltura sono definiti a livello regionale. Ciascuna Provincia stabilisce, mediante un piano di sviluppo agricolo, gli obiettivi delle misure contrattuali. I programmi agroambientali sono finanziati da Stato e Regioni.

Oltre ai programmi agrari propriamente detti, esistono anche programmi relativi al paesaggio rurale, nei quali vengono proposte misure per la tutela e lo sviluppo del paesaggio. Ai fini della conservazione del paesaggio rurale tradizionale, soprattutto nelle aree montane, si provvede tra l'altro a mantenere importanti elementi strutturali storici del paesaggio, come muretti di pietra a secco o siepi, ed a promuovere altre misure di tutela del paesaggio (es. contributi ad hoc per recinti e canali di irrigazione tradizionali). I contributi per la tutela del paesaggio sono finalizzati alla conservazione di singoli elementi del paesaggio rurale. Per il mantenimento di habitat particolarmente preziosi, esistono i premi incentivanti per la tutela e il mantenimento del paesaggio (premi di superficie). Le varie Regioni elaborano linee guida, inventari e piani per la natura e il paesaggio, in base ai quali si orientano le misure e gli incentivi. Ad esempio, i maggiori oneri derivanti da coltivazioni tradizionali e introiti ridotti sono compensati dai premi incentivanti per la tutela e il mantenimento del paesaggio.

Liechtenstein

Con il suo coinvolgimento negli strumenti internazionali a livello mondiale e europeo, il Liechtenstein è fondamentalmente integrato nella cooperazione internazionale e rispettivamente transfrontaliera. Il Liechtenstein, uno Stato con un territorio molto piccolo, ha adottato da tempo il principio generale che gli obiettivi di politica estera, in genere, vengono coordinati sempre in stretta collaborazione con gli Stati vicini, e cioè la regione austriaca del Vorarlberg e i Cantoni svizzeri di San Gallo e dei Grigioni. Per questo motivo, per noi, la cooperazione transfrontaliera era ed è un fattore importante nel campo della natura e dell'ambiente, senza doverla definire appositamente mediante determinate leggi o altri strumenti nazionali. Tale cooperazione nel campo della protezione della natura e del paesaggio esiste, ad esempio, nei settori: ecologia delle acque, riserve forestali, zone umide, gestione delle specie selvatiche di ungulati, dei grandi animali rapaci, specie invasive, passaggi di fauna selvatica e altro.

Dal 2008 si applica il "concetto di sviluppo natura e agricoltura", per il quale negli anni scorsi sono stati elaborati ampi dati di base e nel quadro del quale, in stretta collaborazione con il settore agricolo, si realizzano progetti di rinaturalizzazione e messa in rete nel Liechtenstein, nonché corridoi transregionali con il Cantone di San Gallo e il Land austriaco del Vorarlberg.

Concetto di sviluppo natura e agricoltura: http://www.llv.li/amtsstellen/llv-awnl-natur_und_landschaft/llv-awnl-natur_und_landschaft-entwicklungskonzept_natur_und_landwirtschaft.htm

Slovenia: Economia forestale adeguata alla natura

Le foreste rivestono un ruolo particolare in Slovenia. Con una percentuale del 56,4% in rapporto al territorio nazionale, la Slovenia si colloca al terzo posto in Europa. Inoltre, la superficie forestale è in costante aumento, a causa dell'abbandono delle aree agricole. La selvicoltura si fonda sui principi della sostenibilità, di un'economia adeguata alla natura e della multifunzionalità.

Nel "Programma di sviluppo delle foreste slovene" del 1996 sono riportati i fatti più importanti per quanto riguarda le foreste stesse e la loro funzione ai fini della conservazione della biodiversità. In considerazione del buono stato di conservazione delle foreste, della notevole superficie che ricoprono e della presenza di numerose specie che in Europa sono ormai a rischio, queste foreste sono di particolare importanza per una rete alpina. Gli habitat e le zone umide rilevanti a livello ecologico presenti all'interno delle foreste e le riserve forestali sono sottoposti a particolare tutela.

Il programma di sviluppo prevede la partecipazione delle autorità forestali nonché delle autorità venatorie e delle associazioni di cacciatori alla pianificazione territoriale, soprattutto nella pianificazione delle infrastrutture, al fine di garantire la conservazione degli habitat per la fauna.

Programma di sviluppo delle foreste slovene:
http://www.zgs.gov.si/fileadmin/zgs/main/img/PDF/ZAKONI/Program_razvoja_gozdov_Slovenije.htm

Svizzera: Ordinanza sulla qualità ecologica e direttiva per passaggi faunistici

In Svizzera gli agricoltori, per poter ricevere contributi diretti, devono destinare almeno il 7 per cento dell'area agricola utile a superfici di compensazione ecologica (SCE). Sono considerate superfici di compensazione ecologica prati e pascoli, ricchi di specie, sfruttati in modo estensivo, terreni da strame e siepi nonché altri habitat seminaturali. Oggi le SCE occupano circa il 10% delle superfici agricole utili. A partire dal 2001 l'Ordinanza sulla qualità ecologica (OQE) offre incentivi orientati ai risultati allo scopo di promuovere non soltanto la qualità biologica, ma anche l'interconnessione di superfici di compensazione ecologica. L'interconnessione di superfici di compensazione ecologica ha la finalità di collegare le popolazioni restanti isolate mediante specie obiettivo o specie guida tipiche della rispettiva regione. La qualità dei prati viene giudicata in base a piante indicatrici. In altri tipi di habitat si aggiungono altri criteri, ad esempio per le siepi anche la struttura, la larghezza minima, la provenienza delle specie, la cura. I cantoni devono partecipare al finanziamento. I contributi per l'interconnessione e la qualità sono cumulabili. In breve tempo gli incentivi economici della OQE hanno dato come risultato, soprattutto nelle zone montane, un'ampia

interconnessione e rivalutazione biologica di prati e pascoli ricchi di specie, ma in pericolo a causa dell'intensificazione e dello sfruttamento.

Con la cosiddetta Direttiva ATEC relativa al dimensionamento dei passaggi faunistici (2001) è stato stabilito che i passaggi della fauna selvatica lungo i corridoi di importanza sovraregionale debbano avere una larghezza di 45 +/- 5 m. Durante la redazione di questa disposizione l'Ufficio federale delle strade (USTRA) e l'Ufficio federale dell'ambiente (UFAM) convenirono di risanare e costruire corridoi faunistici intersecanti la rete delle strade nazionali e principali. Questa strategia prevede nei prossimi decenni l'aumento delle possibilità di sovrapassare la rete stradale costruendo circa 50 passaggi ecologici per i mammiferi selvaggi locali. I punti di conflitto da risanare sono stati definiti in linea di massima nel rapporto sui corridoi (SRU 326). La pianificazione dettagliata – e in particolare la scelta esatta dei luoghi e dell'esecuzione architettonica nonché l'interconnessione dell'opera con il suo ambiente – viene elaborata nell'ambito di strategie cantonali. La relativa documentazione, valida per tutto il Cantone o riferita solo ai corridoi riportati nel suddetto elenco, è già disponibile in sei Cantoni e presto anche in altri. Per tre siti dell'elenco sono inoltre iniziati i progetti esecutivi dell'opera. Le informazioni provenienti dal rapporto sui corridoi – in parte completate da quelle della REN (SRU 373), anche sul posizionamento e sul grado di pericolosità dei corridoi per la fauna selvatica – sono entrate inoltre a far parte dei piani indicativi cantonali e in essi aumentano la protezione di queste importanti assi di collegamento.

Ordinanza sulla qualità ecologica (OQE):
http://www.bafu.admin.ch/landschaft/00522/01649/01651/index.html?lang=it

III ATTORI /SETTORI

L’agricoltura, spina dorsale del paesaggio

L’agricoltura ha un impatto importantissimo sulla biodiversità alpina. Molti habitat sono stati creati proprio dall’agricoltura tradizionale. Mentre nelle vallate l’agricoltura intensiva può creare barriere alla migrazione della fauna e alla diffusione della flora selvatica, i terreni agricoli tradizionali in quota ad uso estensivo continuano ad avere un valore straordinario dal punto di vista della biodiversità. A causa dell’ammodernamento dell’agricoltura questi ultimi sono però sempre più minacciati dall’abbandono. Il contributo degli agricoltori alla conservazione e alla valorizzazione delle reti ecologiche può rivelarsi determinante. In particolare le superfici ad utilizzo intensivo si prestano alla creazione di fasce di verde o fasce marginali, oppure di elementi strutturali quali siepi e muretti a secco. Anche la gestione più estensivizzata con la rinuncia all’uso di fertilizzanti, insetticidi ecc. contribuisce a salvaguardare la conservazione della biodiversità e all’interconnessione di spazi vitali. Questo contributo degli agricoltori finalizzato a promuovere la diversità biologica e l’interconnessione ecologica dovrebbe essere adeguatamente indennizzato perché concorre alla conservazione della biodiversità come base della vita e alla salvaguardia di un ambiente di qualità per l’intera società.

Cacciatori e operatori forestali: ambasciatori delle reti ecologiche

I boschi caratterizzano il quadro paesaggistico delle Alpi; più di un terzo della loro superficie, infatti, è coperto da boschi. Accanto alla loro funzione di spazio di vita, di ricreazione, naturale ed economico, le foreste sono anche associate ad un gran numero di servizi ecosistemici (protezione dell’acqua e del suolo, regolazione del clima, attenuazione delle catastrofi naturali). E proprio a causa delle grandi superficie contigue, il bosco è un importante elemento di connessione nel paesaggio.

Vista l’enorme importanza ecologica del bosco, in molti luoghi i cacciatori e gli operatori forestali possono diventare dei veri e propri ambasciatori per le reti ecologiche grazie al loro riconosciuto ruolo tradizionale e alla loro professionalità. La “sostenibilità” è cruciale nell’ambito delle loro attività e quindi essi possono aiutare a sensibilizzare la popolazione sull’importanza di una gestione sostenibile della foresta e della fauna selvatica. Un bosco seminaturale, infatti, con un’alta percentuale di legno morto e fustaia matura è particolarmente adatto ai fini dell’interconnessione di pregiati habitat.

Le riserve forestali possono contribuire alla conservazione di aree pregiate dal punto di vista naturalistico, come ad esempio popolamenti vecchi o boschi cedui in quanto elementi importanti di un’interconnessione di biotopi, proteggendoli dai disturbi antropici. I metodi alternativi di taglio e recupero del legname producono meno danni sui popolamenti e sul suolo. Soprattutto se organizzati in modo ben strutturato, i margini boschivi possono svolgere appieno la loro funzione di punti di collegamento e di zone di ritiro. In questo ambito è fondamentale anche un utilizzo venatorio adeguato per una conservazione del bosco in condizioni seminaturali e salvaguardare quindi le condizioni di vita e di diffusione ottimali per

il maggior numero possibile di specie. Le aree dove non è prevista attività venatoria o dove questa è limitata, sono peraltro disponibili per le specie animali sensibili quali aree centrali o punti d'appoggio. A tale scopo si rivelano particolarmente utili le misure atte a migliorare gli spazi vitali.

I corsi d'acqua sono autostrade naturali

I corsi d'acqua svolgono importanti funzioni ecosistemiche. Essi offrono spazi di vita, forniscono riparo e cibo e in quanto "autostrade naturali" per animali e piante costituiscono elementi connettivi lineari all'interno delle reti ecologiche. I sistemi di risalita e strutture simili permettono a pesci e altre specie abitanti i corsi d'acqua di superare gli ostacoli alla migrazione quali dighe o bacini di laminazione. A lungo termine queste funzioni possono essere assicurate solo tramite la salvaguardia di corsi d'acqua di buona qualità biologica, una dinamica naturale e rinaturalizzando le aree golenali. I boschi ripariali e le zone umide hanno una funzione altrettanto importante ai fini della biodiversità.

Accanto agli enti addetti alla gestione delle acque, la conservazione e la valorizzazione di specchi e corsi d'acqua seminaturali coinvolge anche i pescatori. Loro conoscono l'habitat fiume e i suoi abitanti, le dinamiche ecosistemiche e sono perciò particolarmente sensibili ai suoi cambiamenti. Loro possono supportare le attività della protezione della natura e della gestione delle acque e sono perciò partner importanti ai fini dell'interconnessione ecologica di fiumi, laghi e aree golenali. Perché una pesca sostenibile e corsi d'acqua seminaturali vanno a beneficio non solo della biodiversità, ma anche dei pescatori stessi e di tutti gli utenti delle acque a scopi ricreativi.

Attori chiave: pianificazione del territorio e trasporti

La pianificazione del territorio e del traffico riveste una funzione chiave ai fini della creazione di reti ecologiche. La pianificazione territoriale con i suoi strumenti permette di creare connessioni ecologiche vincolanti nel paesaggio e di tutelarle a lungo termine. Per questa ragione la connettività ed altri interessi d'uso devono essere ponderati fin dall'inizio di tutti i processo pianificatori a livello nazionale, regionale e locale.

Il sistema viario contribuisce soprattutto in corrispondenza dei fondovalle ad una netta frammentazione degli spazi vitali. I potenziali conflitti fra viabilità e assi di migrazione degli animali selvatici possono essere parzialmente risolti ad esempio tramite ecodotti o gallerie, la chiusura periodica di strade o l'introduzione di zone a traffico limitato.

Paesaggi attraenti per la popolazione locale e i turisti

I paesaggi sono parte integrante dell'identità locale e un'importante risorsa per il turismo e l'uso nel tempo libero da parte della popolazione. Questi paesaggi con una grande varietà e ricchezza di strutture e con gli habitat connessi ospitano un gran numero di animali e piante e rappresentano al contempo un ambiente vario e suggestivo con un elevato potenziale turistico.
I corsi d'acqua seminaturali con il loro ambiente circostante e altri elementi paesaggistici svolgono la funzione di corridoi ecologici e connettono gli habitat di piante ed animali. Ma in quanto polmoni verdi garantiscono anche una migliore qualità dell'aria e offrono opportunità interessanti per il tempo libero e il turismo.

Il turismo può quindi beneficiare direttamente di un corridoio ecologico. Il turismo, e in particolare quello intensivo, può compromettere il paesaggio e quindi avere un impatto negativo sui corridoi ecologici. Insediamenti alberghieri, piste da sci e infrastrutture per la mobilità compromettono o addirittura distruggono le connessioni fra habitat della fauna e della flora. Alcune attività sportive e del tempo libero arrecano seri disturbi ad animali e piante e ne danneggiano gli habitat. I responsabili del settore turistico sono perciò partner importanti per garantire una protezione sostenibile del paesaggio e degli spazi naturali connessi. Tramite offerte sostenibili e la sensibilizzazione dei visitatori il turismo può contribuire a valorizzare e promuovere i corridoi ecologici nel paesaggio.

Una protezione della natura su vasta scala

C'è bisogno di un uso sostenibile dei paesaggi pregiati per conservare la biodiversità. L'azione non deve limitarsi alle aree protette, ma va estesa su tutto il territorio, anche e soprattutto fuori dalle aree protette. La conservazione e la promozione dei corridoi ecologici nel paesaggio rappresenta un contributo importante per proteggere la fauna e la flora alpina minacciate e favorire il ritorno di specie endemiche scomparse.

Le misure di protezione della natura sono fondamentali ai fini delle reti ecologiche e concorrono alla conservazione e al miglioramento degli habitat di vitale importanza nei biotopi connessi dove fungono da aree centrali, ma anche da habitat di transizione e biotopi di passaggio. Le misure di protezione permettono anche di creare superfici o strutture di connessione che valorizzano la permeabilità del paesaggio su ampi territori o in determinati punti di conflitto. Le autorità preposte alla protezione della natura a tutti i livelli amministrativi sono chiamate, insieme alle associazioni di protezione della natura e ad altri attori fra i quali i cittadini, gli agricoltori, i selvicoltori e i pianificatori del territorio ad adottare le misure necessarie.

Una sfida politica

Molte misure di protezione della natura come la conservazione e il ripristino di habitat importanti, la rinaturalizzazione di corsi d'acqua, fino alle misure di gestione agro-forestali – ad esempio la creazione di superfici ecologiche di compensazione o la gestione estensiva – ma anche una pianificazione coerente dei trasporti e dell'uso del territorio, possono contribuire alla creazione di reti ecologiche. Sarebbe auspicabile che queste misure fossero rivendicate dagli attori locali e promosse dai decisori politici ai vari livelli. I decisori politici possono sostenere uno sviluppo compatibile con la natura, ad esempio, integrando i criteri di interconnessione ecologica nelle procedure di finanziamento, come viene già fatto in alcuni paesi per il settore agricolo. Ai Comuni che gestiscono gran parte del paesaggio, spetta un compito centrale in questo senso: tramite una pianificazione strettamente connessa al territorio possono definirne le forme d'uso.

Indipendentemente dal settore in cui queste misure devono essere implementate, è sempre necessario garantire che le misure non siano isolate, ma sempre integrate in una strategia globale per la creazione di una rete ecologica.

Informazione e sensibilizzazione

La comprensione dell'importanza delle reti ecologiche e una comunicazione aperta rappresentano la base per un'interconnessione più efficace degli habitat. Ma è di grande importanza anche la connessione a livello socio-economico e culturale.

L'educazione ambientale e la comunicazione costituiscono perciò un aspetto centrale nella pianificazione di progetti sulla connettività ecologica. L'informazione specifica in funzione del rispettivo target e la sensibilizzazione dei diversi attori, ma anche della popolazione in genere, possono contribuire alla riuscita a lungo termine delle iniziative di interconnessione dei biotopi. Maggiore è la sensibilizzazione sull'importanza delle reti ecologiche, maggiore sarà il numero di sostenitori e promotori.

Tutti possono contribuire

Le reti ecologiche non riguardano soltanto progetti di grandi dimensioni, ma tutti possono dare il proprio contributo. Abbiamo numerose possibilità di mettere in rete degli habitat anche su un terreno privato, riducendo così l'impatto negativo della sempre maggiore frammentazione del nostro paesaggio alpino. Il semplice rispetto di determinate scadenze per lo sfalcio oppure le semine ricche di specie sui campi lavorati e nelle zone abitate arricchiscono il quadro paesaggistico e migliorano il collegamento fra spazi naturali. Anche le misure adottate su superfici piccole sono importanti. Ognuno può contribuire in vari modi alla connessione dei biotopi. Per esempio prendendosi cura di un giardino o di un orto biologico, utilizzando il proprio territorio in modo sostenibile o passeggiando in montagna in maniera rispettosa della natura.

Le reti ecologiche, un compito collettivo

Le attività volte a promuovere e conservare la connettività ecologica del paesaggio dovrebbero poggiare su vaste basi. Maggiore è il numero di attori coinvolti, maggiore sarà l'accettazione e il sostegno delle azioni volte a migliorare le reti ecologiche. Con un contributo personale al progetto in fase di pianificazione la motivazione risulta particolarmente alta. A seconda del progetto e dell'orientamento delle attività, risulta utile in particolare il coinvolgimento di altri attori, fra i quali associazioni sportive, parrocchie, scuole e asili, ma anche aziende operanti nel settore energetico o l'ufficio tecnico comunale.

IV BANCA DATI DELLE MISURE

Nature conservation

Conservation, management and creation of new standing water bodies

Standing water bodies include a wide variety of aquatic habitats such as lakes, pools, ponds and tarns. © Rainer Sturm/ pixelio.de

Involved sectors

Agriculture, Forestry, Hunting, Spatial planning, Nature protection, Local population/citizens

Affected habitats

Waterbodies

Description

Standing water bodies include a wide variety of aquatic habitats such as lakes, pools, ponds and tarns. They are refuges for rare protected aquatic plants and animals (amphibians, reptiles, birds, etc.) and are therefore key elements of a biotope network. At appropriate sites, they can be networked with other wetlands and with flowing waters. Standing water bodies are often drained or filled in so that they can be used for other purposes, making their conservation particularly important. Management interventions may be helpful in keeping smaller standing water bodies clear; they may also be conducive to various siltation stages and beneficial to habitats and the transformation of nutrient-rich and silted-up water bodies into near-natural ecosystems. The creation of standing water bodies (e.g. as protected areas for amphibians) is also an option, although conservation should take precedence over the creation of new small water bodies.

Impact

Impact in particular on Reptiles, Amphibians, Birds, Insects, Fish

Ecological impact

Improvement or preservation of habitats	Use of appropriate management measures (e.g. creation of buffer zones against fertiliser and pesticide inputs, thinning-out of riparian woodland) improves habitat quality.
Element of ecological network	Standing water bodies are important elements of a functioning network of different wetlands (e.g. peat bogs, headwaters, humid forests, etc.) as a stepping stone system consisting of near-natural wetland biotopes.
Time of realisation for measure	Weeks: Depending on starting conditions, the impact of appropriate management measures may occur within the short term; when creating new ponds, a number of key criteria must be adhered to.
Impact scope	Local (municipality): In general, the impact is local but depending on the connectivity situation, it may also be regional in scope.

Implementation

Implementation period	Months: Most management measures at standing water bodies can be implemented in the short term. Larger interventions in a water body's internal structure (restoration and remediation) requires more comprehensive planning.
Frequency	Recurring: Most maintenance measures must be repeated.

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): Costs vary considerably depending on the type of measure being implemented. Costs of creating new standing water bodies are estimated at approx. € 20,000 (2000 m²) - 70,000, depending on size.
Socio-economic impacts	Low: Intact standing water bodies contribute to an attractive and diverse landscape appearance (tourism).
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Management measures can be supported from various funding programmes (e.g. contract-based nature conservation). Payments amount to around € 450-600/ha. Near-natural lakes are generally legally protected nature conservation areas.

Further information

Evaluation	Management measures at standing water bodies have long made an important contribution to the conservation, management and development of ecologically valuable areas. Relevant experience is available from the responsible authorities/nature conservation associations.
Information	Other: The various nature conservation agencies and organisations (NABU, BUND, LBV, Pro Natura etc.). More information and examples can also be accessed at: http://www.landwirtschaft-mlr.baden-wuerttemberg.de/servlet/PB/menu/1064781_l1/-index1221750829191.html

Controlling invasive species

Ambrosia - one of the best known invasive species. © Martin Richter/ pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Hunting, Nature protection, Local population/citizens

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Invasive species are alien plants and animals that have negative impacts on other species, biological communities or biotopes and thus pose a threat to biodiversity. Invasive species may also cause economic problems (e.g. when present as weeds) or health problems (such as allergies and diseases). Hybridisation with native species can also occur. In Switzerland, 107 alien species are classed as problematical, including mammals, birds, reptiles, amphibians, insects and plants. When dealing with alien species and adopting measures to limit them, prevention, monitoring, acceptance, surveillance and control all have a role to play. In the context of ecological connectivity, particular account must be taken of invasive species as they are able to use the emerging connecting bridges in the landscape to penetrate into new areas. In the case of invasive neophytes, this applies especially to stream margins and riparian zones (distribution along collapsed river banks and via erosion and flooding), which, as natural connecting elements in the landscape, are also important elements of the biotope network.

Impact

Ecological impact	
Improvement or preservation of habitats	Awareness of the impacts of invasive species is required, justifying control measures (e.g. specific threat posed to rare or endangered species, risk of penetration of invasive species into new areas).
Element of ecological network	Control measures constitute major intervention and generally entail considerable effort as well as damage to other species (e.g. scarification as a result of root removal)
Other	Measures should only take place if it is certain that the habitat concerned can be restored to a stable ecological state following the measure and its long-term conservation in this state is guaranteed.
Time of realisation for measure	Years: The duration of measures until the attainment of an effect is difficult to estimate and depends substantially on the species concerned and the measures taken.
Impact scope	Very localised (plot): The impact of measures is very limited in spatial terms.
Implementation	
Implementation period	Months: Here too, many different measures and implementation periods are possible.
Frequency	Recurring: Generally long-term strategies are needed to fight invasive species effectively.

Economic and legal aspects

Costs	High (100'000-1 Mio EUR): Very variable. Cost of controlling all stocks of Japanese Knotweed in Germany, for example, is € 6.2 mill. + € 16.7 mill. for subsequent stabilisation of river banks.
Socio-economic impacts	Medium: High costs of control can be set against the very substantial economic impacts associated with alien species, estimated at USD 13.8 billion p.a. in the US.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	International treaties, European and national legislation regulate the management of invasive species: Convention on Biological Diversity, Habitats Directive, Birds Directive, federal states' nature conservation legislation, plant protection legislation, hunting legislation.

Further information

Evaluation	In view of the many examples, a species-specific perspective must be taken. Comprehensive experience has been gained with various measures to deal with some species (e.g. Japanese Knotweed: mowing, grazing, herbicide use, combined procedures). It is always important to weigh up the relationship between the negative impacts, on the one hand, and intervention and its costs, on the other.
Information	Other: Comprehensive information on neophytes in Germany: http://www.floraweb.de/neoflora/index.html , Delivering Alien Invasive Species In Europe (DAISIE): http://www.europe-aliens.org/ , North European and Baltic Network on Invasive Alien Species (NOBANIS): http://www.nobanis.org , Report on invasive species in Switzerland: http://www.nobanis.org/files/invasives%20in%20CH.pdf ; aquatic alien species: http://www.aquatic-aliens.de/species-directory.htm

Restoration of wetlands

The removal of trees and shrubs is a measure for the renaturation of fens and bogs. © Bund Naturschutz Ostallgaeu

Involved sectors

Agriculture, Forestry, Water management, Spatial planning, Tourism and leisure, Nature protection

Affected habitats

Bogs and fens, wetlands

Description

Wetland habitats are especially species-rich and are a dominant feature of the natural landscape structure in the Alpine region and the pre-Alps. Wetlands also provide a habitat for numerous rare and highly endangered species (e.g. the Azure Hawker (Aeshna caerulea)) and are therefore important elements of a biotope network. Wetland restoration measures can bring about an improvement in the hydrological regime of degraded wetlands and generally enhance habitat quality. Peat growth resumes in the rewetted areas, allowing an increase in typical wetland species. This also improves the function of wetlands as CO2 sinks and water stores, supporting the avoidance of and adaptation to climate change. Rewetting can include impounding measures, e.g. blocking drainage ditches, changes in the type of use, and management measures such as the removal of tree and shrub cover.

Impact

Impact in particular on	Reptiles, Amphibians, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Improving the quality of wetland habitats (typical wetland vegetation and fauna) through mowing of wet meadows and litter meadows, debushing and impoundment. Development of structurally rich forest/open land transitions as habitats for black grouse and wood grouse (capercaillie).

Element of ecological network	Intact peat bogs are important elements of a network of different wetlands (headwaters, humid forests, etc.)
Time of realisation for measure	Years: Wetland restoration measures must be long-term in focus and constantly reviewed. Depending on the measure and the starting conditions, impacts may be achieved quickly or over the long term.
Impact scope	Regional: The scope of impact can be increased if relevant measures are embedded in a comprehensive (regional) strategy.
Implementation	
Implementation period	Years: Wetland restoration measures should be embedded in a long-term comprehensive strategy, although individual measures can be implemented over the short term.
Frequency	Recurring: Includes a wide variety of measures, many of which should be long-term and repeated regularly.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Costs vary with size of area, measures to be implemented and implementation period (approx. € 150-6000/ha).
Socio-economic impacts	Low: Tourism and marketing strategies can be promoted as part of a comprehensive strategy (e.g. use of litter, "peat bog tourism").
Sources of financing	Private sponsor, Public: local, Public: regional, Public: national, Public: European
Legal situation	Wetland restoration mesures can be integrated into various countryside management programmes and receive appropriate funding on that basis.
Further information	
Evaluation	Numerous wetland restoration initiatives exist. Often, such measures are successfully implemented as part of biotope network initiatives. Socio-economic aspects such as sensitising and informing the public and political decision-makers, promoting "peat bog tourism" and the development of marketing strategies for agricultural products from the region play a role (e.g. Allgäuer Moorallianz).
Information	Other: http://www.cipra.org/de/cc.alps/wettbewerb/moorrenaturierung , http://www.bfn.eu/allgaeu110.html
Contact	Germany: Dr. Christine Margraf, Bund Naturschutz in Bayern e.V. christine.margraf@bund-naturschutz.de

Good Practice	Wetland restoration in the Bavarian Alps: the Allgäuer Moorallianz Renaturation des tourbières : l'exemple de l'Allgäuer Moorallianz Rinaturalizzazione delle torbiere: l'esempio della Allgäuer Moorallianz

Establishment of resting areas for birds along streams

The structures associated with flowing waters are often important resting areas. © Mensi/ pixelio.de

Involved sectors

Water management, Fishery, Spatial planning, Tourism and leisure, Nature protection, Other: Sports Associations

Affected habitats

Waterbodies

Description

The structures associated with flowing waters, such as gravel banks, provide important habitats for a number of species which breed on gravel areas (e.g. the Common Sandpiper (Actitis hypoleucos) and Little Ringed Plover (Charadrius dubius)). These areas are often used for recreation and sporting activities. Management strategies, such as the creation of quiet zones for breeding birds at particular times (including bans on access), can cut through existing conflicts and contribute to habitat improvement. Relevant measures can include the adaptation and development of infrastructure, the creation of observation points, and channelling of and information for visitors using info-boards and signage.

Impact

Impact in particular on	Birds

Ecological impact	
Improvement or preservation of habitats	The creation of a quiet environment on gravel banks during breeding periods improves habitat quality for gravel-breeding species.
Element of ecological network	Natural flowing water systems and their associated structures are valuable elements of a biotope network and form stepping stone biotopes for some species.
Time of realisation for measure	Months: Depending on the time of implementation, the quiet zones can soon start to be used as a breeding ground.
Impact scope	Regional: The breeding areas may be of transregional importance for some species.
Implementation	
Implementation period	Years: When planning measures at the specific site, a longer time period should be planned (involvement of all stakeholders, assessment of stocks of breeding birds, etc.)
Frequency	Non-recurring: For greater effectiveness, this should be a long-term activity adapted to emerging needs.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Costs are heavily dependent on starting conditions and the scope of the requisite measures.
Socio-economic impacts	Low: When combined with attractive offers for visitors, tourist value-added can be generated.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Relevant measures can be funded from countryside management programmes.
Further information	
Evaluation	As part of the Interreg III B Project "Living Space Network" (Pilot Project "Running Waters"), a conservation strategy for gravel-breeders at Halblech was developed. However, conflicts between gravel-breeding species of bird and recreational use exist at almost all stretches of rivers where gravel banks still exist. There are also examples of the creation of quiet zones, with low disturbance, for wild mammals and birds along the Danube.

Information	Austria: INTERREG project: http://www.lsn.tirol.gv.at/de/doc/kiesbrueter.pdf Danube: http://www.land-oberoesterreich.gv.at/cps/rde/xchg/ooe/hs.xsl/73053_DEU_HTML.htm
Contact	Austria: e.g. Office of the Government of Upper Austria, Department of Spatial Planning, Economic and Rural Development, Nature Conservation Division

Taking account of bat roosts during the restoration and renovation of old buildings

The Alpine area is characterised by a fauna rich in bat species. © IRKA

Involved sectors

Nature protection, Transport, Local population/citizens, Other: Church, Building authorities, Architects

Affected habitats

Areas for settlements and transport

Description

Because of its near-natural state and landscape diversity, the Alpine area is characterised by a fauna rich in bat species. Many species of bat are heavily dependent on buildings for their roosts because natural hiding places have become rare in woodlands as a result of intensive forms of cultivation. During the restoration or renovation of old buildings, disturbances to the bats and their roosting places can therefore easily occur. Appropriate measures during the restoration or renovation of old buildings can help to preserve bat roosting places. There is already a wealth of experience among bat experts, who often provide support during the renovation of buildings. Targeted consideration of relevant information on the ecology of roosting places of various species of bat can thus make a major contribution to habitat connectivity.

Impact

Impact in particular on	Small mammals
Ecological impact	
Improvement or preservation of habitats	Many species of bat (including several listed in Annex II of the Habitats Directive) are dependent on old buildings for their roosts.
Element of ecological network	The roosts, together with the hunting grounds, are important elements of an ecological network. The distance between exits and the nearest vegetation and potential hunting grounds must be considered.
Time of realisation for measure	Months: With appropriate restoration measures, the roosts may be colonised by the bats within the first year.
Impact scope	Local (municipality): Measures focus on individual buildings but the connectivity situation (e.g. proximity of hunting grounds) should be considered. A comprehensive strategy should also be in place, requiring support from bat experts during restoration work.

Implementation

Implementation period	Months: Relevant measures can be integrated into restoration work. The measures should be carried out while the bats are absent and should not lead to major changes to the characteristics of the roosts.
Frequency	Non-recurring

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): Costs depend on starting conditions and the needs of the bat species concerned; compensation payments may be available in some cases.
Socio-economic impacts	Low: Taking account of bats during the restoration of buildings may incur additional costs.
Sources of financing	Private sponsor, Public: local, Public: regional, Public: European
Legal situation	Restoration of bat roosts often requires permission under nature conservation legislation.

Further information

Evaluation	Within the framework of the Interreg III B Project “Living Space Network”, comprehensive Guidelines for the Renovation of Buildings were produced, drawing on more than 230 case studies relating to the renovation of buildings, mainly from the Alpine area, and containing specific information for around 20 different bat species.
Information	Other: Guidelines: http://www.lsn.tirol.gv.at/de/doc/leitfad_fledermaus.pdf ; Interreg Project: http://www.alpinespace.org/uploads/media/LSN_Handbook_for_Bats_Protection_DE.pdf , http://www.fledermausschutz.at/downloads/GuidelinesfortheRenovationofbuildings.pdf (en)
Contact	Other: Dr Guido Reiter, Austrian Co-ordination Centre for Bat Conservation and Research (KFFÖ) Dr Andreas Zahn, Co-ordination Centre for Bat Conservation in South Bavaria
Good Practice	Habitat connectivity for bats in the Alpine region Mise en réseau des habitats de chauves-souris dans l’espace alpin Messa in rete degli habitat dei pipistrelli nell’arco alpino

Specific species conservation measures: wood grouse (capercaillie)

The wood grouse is a characteristic species of light, structurally rich boreal and montane forest habitats. © Eidgenössische Forschungsanstalt WSL

Involved sectors

Forestry, Hunting, Tourism and leisure, Nature protection

Affected habitats

Forest, Grassland

Description

The wood grouse (capercaillie) (Tetrao urogallus) is a characteristic species of light, structurally rich boreal and montane forest habitats. Due to its extensive spatial and specific habitat requirements, it is regarded as an umbrella species for the high-montane community. Acutely endangered as a result of habitat losses and degeneration, it is a target species under the EU Birds Directive. The species therefore plays a key role in nature conservation and spatial planning, not only from a conservation but also from a socio-cultural and socio-economic perspective. Due to its habitat requirements, support measures for capercaillie contribute directly to the implementation of biotope network concepts, e.g. through the creation of mosaics of different habitats and corridor and stepping stone structures.

Impact

Impact in particular on	Birds

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Reduction of fragmentation effect of normal commercial forest stands.
Improvement or preservation of habitats	All measures primarily aim to improve the habitat for grouse and thus address the primary threat to the species.

Element of ecological network	Structures which characterise wood grouse (capercaillie) habitat are suitable as connective structures for other species as well.
Other	Various potential fields of conflict are addressed in relation to the wood grouse (capercaillie) (tourism/recreation, commercial forestry).
Time of realisation for measure	Years: Management measures for wood grouse populations entail long-term commitment and permanent changes to usage and procedures.
Impact scope	Local (municipality): With wood grouse in particular, measures always have regional as well as local significance.
Implementation	
Implementation period	Days: Individual management measures do not take up much time, but a regular and comprehensive approach is required to achieve the desired impacts.
Frequency	Recurring: Most of the relevant measures require regular implementation.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Varies widely according to the measures undertaken; no general estimate possible.
Socio-economic impacts	Low: Measures which benefit the wood grouse will also have a positive impact on other species in montane forests.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	Wood grouse is protected by a raft of legislation (Natura 2000).
Further information	
Evaluation	In some regions, wood grouse is regarded as an umbrella species for biotope network projects. It is reliant on richly structured and differentiated habits. Ecological connectivity is therefore particularly important here, especially as wood grouse populations are often highly endangered.
Information	Other: e.g. Capercaillie Action Plan, Federal Office for the Environment (FOEN), Switzerland. Detailed information about the wood grouse (capercaillie): http://www.waldwissen.net/

Contact	Other: e.g. National coordination centre of the Swiss species recovery programme for birds: Ueli Rehsteiner, Swiss Association for the Protection of Birds SVS/BirdLife Switzerland ; Reto Spaar, Swiss Ornithological Institute

Specific species conservation measures: beaver

Lots of animals establish living spaces in unique waterbodies that were shaped by beavers. © Marion Heidemann-Grimm/pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Hunting, Nature protection, Transport, Other: Energy

Affected habitats

Waterbodies

Description

Hardly any other species shapes and influences its habitat as actively as the beaver. The beaver makes burrows in riverbanks, builds dams, and fells trees. Before humans began to shape the landscape actively through their land use, there was a broad network of pools, created by beavers, along the watercourses. Many other species of fauna have developed in a water landscape which the beaver has done much to create. And yet the beaver was on the verge of extinction in Europe. It is now progressively recolonising numerous watercourses. Since its return, the beaver is bringing many of the watercourses made moribund by human activity back to life and restoring their dynamism. It creates a mosaic of new habitats and structures by opening up vegetation, promoting deadwood, and creating pools and dams. This results in more attractive landscapes and a biotope network along the

watercourses and helps to improve watercourse and flood protection.

Impact

Ecological impact

Improvement or preservation of habitats	Many other species of fauna have developed in a water landscape which the beaver has done much to create. It is therefore described as a key species of fauna for small water bodies. Long-term studies in Germany have shown that the beaver has an extremely positive effect on numerous species of aquatic and riparian flora and fauna.
Element of ecological network	The beaver helps to restore water bodies and thus actively increases species diversity and the diversity of water body structures, thus creating natural corridors along the watercourses.
Other	The beaver also helps to clean the watercourses; the water flows more slowly as a result of the dams built by beaver, causing sediments and substances such as chemicals and nutrients to be deposited. These substances would otherwise promote algal growth and lead to oxygen depletion. More flood events occur in regions without beavers' dams.
Time of realisation for measure	Long term: The restructuring of watercourses by beaver is a long-term process.
Impact scope	Regional: Measures to promote beaver, but also the problems caused by them, must be addressed at both local and regional level.

Implementation

Implementation period	Long term: In areas where beaver occurs, conflicts will always arise. Coexistence with beaver must be re-learned for the long term.
Frequency	Recurring: Long-term implementation of a series of measures, area management is essential.

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): Varies according to the measures adopted. Farmers receive payment for ecological services in areas with beaver.
Socio-economic impacts	Low: The beaver provides various "ecological" services, including flood protection.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	In some federal states, the beaver is covered by hunting legislation.

Further information

Evaluation	There are various conflicts with beaver: collapsed pathways, felled trees, agricultural damage. However, this damage rarely occurs more than 10 m from the river bank. This should be established as a buffer zone along watercourses in order to restore their natural dynamism and thus make an effective contribution to the biotope network.
Information	Switzerland: e.g. Biberfachstelle (Beaver Advice Centre), Neuchatel, Switzerland
Contact	Switzerland: Contact person at Beaver Advice Centre: Christof Angst

Preparation of Natura 2000 management plans

Natura 2000 is an EU-wide network of protected areas intended to preserve the endangered habitats and species in the EU. © Dieter Schütz/ pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Hunting, Tourism and leisure, Nature protection

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Natura 2000 is an EU-wide network of protected areas intended to preserve the endangered habitats and species in the EU. It comprises the protected areas defined in Council Directive 79/409/EEC on the conservation of wild birds (Birds Directive) and in Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive), and aims to build a coherent ecological network. Binding provisions apply to the implementation of Natura 2000, including a requirement to produce management plans defining mandatory conservation measures for the area in question. The plans consist of a basic part and a section containing relevant measures, which describes which species and habitat types contribute to the specific ecological value of the area and the conservation objectives that this creates for the area concerned. This gives rise to an obligation to maintain and where appropriate develop connecting features of the landscape with a view to improving the ecological coherence of the Natura 2000 network (Articles 3 and 10). Member states are also required to take measures to improve the connectivity of the Natura 2000 areas outside these areas themselves (Article 10).

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects, Fish
Ecological impact	
Improvement or preservation of habitats	The measures laid down in the management plan must impact positively on the areas' environmental status with all its species and habitats (favourable conservation status, requirement for improvement).
Element of ecological network	The coherence of the Natura 2000 network must be safeguarded. Measures should be promoted that protect both the specific network of habitats inside and outside an area and the overall site which has other valuable biotopes (national biotope network).
Time of realisation for measure	Years: The production of management plans usually takes a period of 1-3 years, and the measures to be implemented are only carried out after the planning process has been completed.
Impact scope	Regional: The measures contained in the management plan must take account of the specific connectivity in the area; individual management measures can be of transregional importance.
Implementation	
Implementation period	Long term: The measures contained in the management plan are planned for a long period of time (approx. 10 years). The implementation periods of the individual measures can differ greatly.

Frequency	Recurring: Implementation of management plans is a long-term activity.

Economic and legal aspects

Costs	High (100'000-1 Mio EUR): Depending on the species and habitats in the area concerned, about €150-190 per km2.
Socio-economic impacts	No direct impact: In the case of Natura 2000, account must be taken of socio-economic interactions with other sectors as well as of the environmental structure and nature conservation concerns.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	The management plans are based on the Habitats Directive, the Birds Directive and No. 6.1 of the Joint Declaration of 4 August 2000 concerning the protection of the European Natura 2000 network. The implementation of the measures is to be supported by state programmes (e.g. contract-based nature conservation programmes).

Further information

Evaluation	The management plans for most Natura 2000 areas are currently being produced. Few experiences have therefore been made as to how connectivity measures are actually being included in the management plans and what the long-term impacts of these will be. In principle, the demarcation of Natura 2000 areas alone will not be enough to achieve the goal of a coherent ecological network.
Information	Other: EU information: http://ec.europa.eu/environment/nature/legislation/-habitatsdirective/index_en.htm
Contact	Other: Further information may be obtained from the national authorities concerned.

Reporting duties and general monitoring in the Natura 2000 framework

The Flora-Fauna-Habitat Directive protects the otter in the context of Natura 2000 areas. © Templermeister/ pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Hunting, Tourism and leisure, Nature protection

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Natura 2000 is an EU-wide network of protected areas intended to preserve the endangered habitats and species in the EU. It comprises the protected areas defined in Council Directive 79/409/EEC on the conservation of wild birds (Birds Directive) and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive), and aims to build a coherent ecological network. The designation of Natura 2000 areas creates an obligation to maintain, on a permanent basis, favourable conservation status of the species and habitat types through appropriate protection and development measures (management plan). To this end, member states are required to draw up a report at regular intervals (6 years) on the implementation of the measures taken under the two Directives. The Habitats Directive also requires member states to undertake surveillance of the conservation status of the natural habitats and species of Community interest. The reports should therefore include the key findings of this surveillance. Consideration should also be given to improving the ecological coherence of Natura 2000 outside the designated Natura 2000 areas.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects, Fish

Ecological impact

Improvement or preservation of habitats	The reporting duties and monitoring activities relate to the measures laid down to preserve favourable conservation status and their impacts. This is the first comprehensive statutory regulation for monitoring success in nature conservation.
Element of ecological network	The coherence of the Natura 2000 network must be safeguarded. Measures should be promoted that protect both the specific network of habitats inside and outside an area and the overall site which has other valuable biotopes (national biotope network).
Time of realisation for measure	Long term: Reports have to be produced on the status of the Natura 2000 network components every six years and member states should also undertake general surveillance of the natural habitats and species in question.
Impact scope	Regional: General surveillance should also take place outside Natura 2000 areas, as its purpose is to monitor the conservation status of the natural habitats and species with particular regard to priority natural habitat types and priority species, regardless of territorial context.
Implementation	
Implementation period	Long term: As part of Natura 2000, measures to improve the connectivity situation (conservation status of species) are planned and monitored over the long term.
Frequency	Recurring: Ideally, mowing should be managed over a number of years.

Economic and legal aspects

Costs	High (100'000-1 Mio EUR): Very variable as they are heavily dependent on the data already available, the reported species and habitats, the conservation status etc.
Socio-economic impacts	No direct impact: In the case of Natura 2000, account must be taken of socio-economic interactions with other sectors as well as of the environmental structure and nature conservation concerns.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Pursuant to Article 11 of the Habitats Directive, general surveillance of the species and habitats of community interest should be undertaken and the main results of this general surveillance must be included in the report. The reporting duty is carried out pursuant to Article 17 of the Habitats Directive.

Further information

Evaluation	The current reporting period runs from 2007 to 2013 and the next reports must be submitted in 2013. For the first time, these must be based on suitable monitoring systems, and can include a comparison with the previous report (2007). This will show the effectiveness of the measures undertaken, also in relation to the connectivity situation.
Information	Other: EU information: http://ec.europa.eu/environment/nature/-legislation/habitatsdirective/index_en.htm
Contact	Other: Further information may be obtained from the national authorities concerned.

Agriculture

Land set aside

Areas of wild herbs on agricultural fields provide important areas for resting, breeding, feeding, mating or cover. © Kerstin Ziebandt/ pixelio.de

Involved sectors

Agriculture, Nature protection

Affected habitats

Bogs and fens, wetlands, Grassland, Arable land

Description

Set-aside areas distributed across the agricultural landscape can create high-quality habitats for wild fauna and flora and thus contribute on a sustainable basis to the conservation of characteristic communities in open farmland. Diverse vegetation structures, e.g. areas of wild herbs on agricultural fields, provide important areas for resting, breeding, feeding, mating or cover (e.g. for Corn Bunting (Emberiza calandra), Skylark (Alauda arvensis) and Brown hare (Lepus europaeus)) and provide overwintering areas for insects and spiders. They can compensate for the loss of former near-natural habitats and take on regulatory functions. They also act as a buffer to other habitats and due to their insular distribution, are important elements of the biotope network in the otherwise intensively used agricultural landscape. Areas of wild herbs on agricultural fields can be established as rotational fallow and wildflower strips (established for 2-6 years in the agricultural landcape; the fields are sown with native field species and wild herbs and are not fertilised or treated with pesticides).

Impact

Impact in particular on	Small mammals, Big mammals, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Set-aside areas act as buffer zones between different forms of use, especially close to ecologically valuable biotopes, and provide a habitat for rare species.
Element of ecological network	Fallow areas act as stepping stone biotopes. This impact is greatly increased through the inclusion of the areas in local planning.
Other	Set-aside areas reduce nitrogen inputs and contribute to soil protection.
Time of realisation for measure	Months: Areas enhanced in this way provide year-round habitats.
Impact scope	Local (municipality): The impact of the measure can be greatly increased if individual sites are integrated into a broader network (e.g. field margins, extensively managed areas, hedges).

Implementation

Implementation period	Weeks: Establishment and maintenance (seeding with site-appropriate mixes of native grasses/herbs, soil management) of the set-aside areas can be well-integrated into routine land management.
Frequency	Non-recurring, Recurring: The set aside land can change annually, but should be part of an overall set aside concept.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Set-aside may be subsidised by up to €200/ha p.a.
Socio-economic impacts	Low: Subsidies can provide a basic income for farmers. Set-aside also enhances the appearance of the landscape and safeguards pollination of crops.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Relevant measures are subsidised through various countryside management and cultural landscape programmes.

Further information

Evaluation	Set-aside was introduced by the EU from 1988/89 (mandatory from 1993/94) to 2007/08 with the aim of regulating the quantities of farm goods being produced. In Switzerland, direct payments are still linked to "evidence of ecological performance", which includes, among other things, the provision of an appropriate proportion of ecological compensation areas.
Information	Switzerland: http://www.landwirtschaft.ch/de/wissen/oekologie/ Further information is available from the relevant authorities.

Extensive use of grasslands

Extensively used grassland is often speies-rich. © Markus Jenny

Involved sectors

Agriculture, Hunting, Nature protection

Affected habitats

Grassland

Description

Extensively used grassland is extremely important for the biotope network due to its species richness. Alongside direct extensivisation of use (e.g. zero to moderate fertilisation, no use of plant protection products, no ploughing up of grassland or sowing), low frequency of cutting (max. 2-3 times a year), together with later cutting and specific mowing techniques can also help to improve biotope functions. High cutting (mowing height 10-12 cm) can protect amphibians, ants and ground breeders. By using mosaic and phased mowing (i.e. mowing at different times on different areas), and by leaving peripheral areas unmown, food sources can be created for insects (especially bees) as well as refuges for wild fauna.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Extensivisation increases the permeability of the landscape matrix and thus mitigates possible barrier effects of farmland.
Improvement or preservation of habitats	Species-rich grassland fulfils the habitat requirements of rare species and acts as a buffer zone between different forms of use and intensively used areas.

Element of ecological network	Extensive areas of grassland are important elements of the biotope network. The impact is increased if individual areas are integrated into a network of extensively used margins and scattered dry meadows.
Other	Supports groundwater and soil protection; protects against erosion.
Time of realisation for measure	Months: Species-rich grassland provides valuable refuge areas, including in winter. The impact is especially high during the vegetation period.
Impact scope	Local (municipality): Local planning of a network of extensively used areas and scattered species-rich meadows increases the impact of individual sites.

Implementation

Implementation period	Weeks: Extensive management practices can be well-integrated into land management. Some specialist equipment may be required (e.g. double blade cutting bar). Long-term strategies (min. 5 years) should be aimed for.
Frequency	Recurring

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Renunciation of mineral fertiliser use is subsidised to approx. €150/ha; up to approx. €300/ha is paid for adherence to provisions governing cutting times.
Socio-economic impacts	Low: Enrichment of landscape appearance and therefore increased recreational value; ensures pollination of agricultural crops.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Extensive grassland use is an element of cultural landscape/countryside management programmes and contractual nature conservation. Subsidies are therefore provided for specific extensivisation schemes.

Further information

Evaluation	The promotion of extensive grassland has long formed part of cultural landscape conservation programmes and contractual nature conservation. Further information can be obtained from the relevant authorities and nature conservation organisations. Funding criteria and conditions vary widely according to country and region.
Information	Other: All relevant nature conservation and agricultural authorities.

Species rich seeding on agricultural fields

Species rich seedings enrich the landscape's appearance. © qay/ pixelio.de

Involved sectors

Agriculture, Hunting, Nature protection, Other: Beekeepers, Countryside management associations

Affected habitats

Arable land

Description

Species-rich seeding of wild and cultivated plants on set-aside or other areas (e.g. "green" areas created in compensation for natural spaces lost through construction of roads etc.; fallow land in residential areas), can enrich the landscape’s appearance and make a valuable contribution to the biotope network. Seeding with wild species provides a source of food and cover for wild fauna and, depending on the mix of seeds used, can also provide habitats for insects (butterflies, bees, ground beetles, spiders). Sown areas are also used by hedge dwellers (e.g. the Red-Backed Shrike (Lanius collurio)) as substitute habitats. Seeding should take place from mid-April to the end of June, and depending on the condition of the site, may require preparatory measures (e.g. removal of weeds, ploughing etc.). Suitable seed assortments are commercially available.

Impact

Impact in particular on	Small mammals, Big mammals, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Areas which have undergone species-rich seeding provide habitat for rare species and can have a buffer effect in the intensively used agricultural landscape.

Element of ecological network	The relevant areas can act as stepping stone biotopes in the biotope network, and the impact can be increased if integrated into a broader strategy.
Other	Soil fertility.
Time of realisation for measure	Months: Some months elapse between the adoption of the preparatory measures and the appearance of the full impact during the vegetation period.
Impact scope	Local (municipality): If integrated into a broader strategy (local planning) which includes field margins, for example, a heightened impact can be achieved.
Implementation	
Implementation period	Weeks: Seeding does not involve a great deal of work, and generally, no management is required afterwards.
Frequency	Non-recurring, Recurring: Preferable long-term programmes, but implementation of a single measure can be effective.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Costs are likely to amount to approx. €150/ha p.a. over a 5-year period.
Socio-economic impacts	Medium: Depending on the seed mixture, specific plants can be used (herbs, flowers). Enhances the visual appearance of the landscape (tourism). Significance for hunting, bee-keeping.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Species-rich seeding can form part of countryside management/cultural landscape programmes.
Further information	
Evaluation	Areas which have undergone species-rich seeding have long formed part of contractual nature conservation programmes. There are various examples of schemes which have been implemented as part of biotope networking initiatives. In Bavaria, a pilot project (“The Biotope Network in the Cultural Landscape”) was carried out from 2000-2005, and various seed mixtures are available via this scheme.
Information	Germany: http://www.lwg.bayern.de/landespflege/-landschaftspflege/25786/ansaat_pilotpro.pdf, http://www.lebensraum-brache.de/Projekte/Lebensraum_Brache/index.php/

Contact	Germany: Bavarian State Institute for Viticulture and Horticulture (LWG), Countryside Management Department, contact: Martin Degenbeck
Good Practice	Species rich seeding on agriculturral fields, Würzburg district, Germany Exemple du district de Würzburg, Allemagne Esempio della regione di Würzburg, Germania

Promotion of organic farming

Landscape elements enhance biological diversity. © Jan Freese/ pixelio.de

Involved sectors

Agriculture

Affected habitats

Grassland, Arable land

Description

Many endangered species of fauna and flora are dependent on agricultural habitats, so in terms of conserving biological diversity, extensivisation of agricultural use should be the aim on ecologically significant areas. In this context, organic farming has an extremely important role to play, one reason being that it avoids and reduces the environmental stresses which can otherwise arise in farming. Furthermore, the targeted creation of landscape elements (ecological compensation areas such as hedgerows, fallow areas, forest strips and extensive meadows) make an important contribution to the promotion of biological diversity. These areas are also important elements of a biotope network.

Impact	
Impact in particular on	Small mammals, Reptiles, Amphibians, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Extensively managed spaces are important habitats for a wide range of species and act as buffer zones in an intensively farmed landscape.
Element of ecological network	Extensive areas are important elements of the biotope network. The impact is increased if individual areas are integrated into an network of extensively used margins and scattered dry meadows.
Other	Positive impact on soils and the hydrological regime.
Time of realisation for measure	Years: A positive impact can already be achieved after the implementation of individual measures (e.g. creation of hedge structures); a longer period is required for full conversion to organic farming, however.
Impact scope	Local (municipality): Tends to be localised, as individual organic farms are scattered across the countryside. With a larger-scale approach and the incorporation of other structures, the connectivity impact increases accordingly.
Implementation	
Implementation period	Years: The length of time required for conversion to organic farming depends, among other things, on operating structures. As a rule, at least 12 months must elapse until produce can be marketed as organic.
Frequency	Recurring
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Conversion is extremely cost-intensive (additional equipment, more space, etc.). Exact costs are highly dependent on operating structures.
Socio-economic impacts	Medium: From a long-term perspective, positive effects through financial support and greater security of sales. Good marketing strategies are key.
Sources of financing	Public: local, Public: regional, Public: national, Public: European

Legal situation	Organic farming and conversion can be subsidised from countryside management/cultural landscape programmes (generally approx. € 200-500/ha p.a.).

Further information

Evaluation	The positive impact of organic farming on the natural environment and landscape is recognised and backed by numerous studies. This demonstrates the importance of organically farmed areas as elements of the biotope network. Information about conversion and funding opportunities can be obtained from the relevant ministries, authorities and growers' associations.
Information	Germany: Organic farming in Rhön: Innovative example of how to ensure sales: http://www.bionade.de/de/partner-projekte/umwelt/biosphaererhoen/

Extensive agriculture

Patches of flowering plants can make a contribution to the extensivisation of use in the farmland biotope. © Hermann/ pixelio.de

Involved sectors

Agriculture, Nature protection

Affected habitats

Arable land

Description

Agricultural extensivisation measures include extensive (restriction of intensive crop cultivation, i.e. maize, wheat) and diverse crop rotation (cultivation of at least five different crops per year), reductions in the use of mineral fertilisers and chemical plant protection products, suspension of cultivation during breeding periods, and reduced density of grain sowing. Winter vegetation as well as green strips and patches of flowering plants can make a contribution to the extensivisation of use in the farmland biotope. In the long term, such measures promote the conservation and improvement of ecologically valuable habitats on farmland sites, especially for field breeders and wild herbs on agricultural fields. By upgrading farmland as a habitat, extensivisation measures make an important contribution to the biotope network. Extensively used areas are important insular and stepping stone biotopes, especially in an intensively used agricultural landscape.

Impact

Impact in particular on	Small mammals, Birds, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Extensivisation increases the permeability of the landscape matrix and thus decreases the possible barrier effects of farmland.

Improvement or preservation of habitats	Measures for the extensivisation of agriculture improve habitat quality (species richness) and create buffer zones to areas of intensive use.
Element of ecological network	Extensively used areas are important elements of a biotope network. The impact is increased if individual areas are integrated into a network of extensively used spaces (including other biotope types, e.g. meadows).
Other	Supports groundwater and soil protection, protection from erosion.
Time of realisation for measure	Months: The impact of relevant measures starts soon after implementation.
Impact scope	Local (municipality): Local planning of a network of extensively used areas (including grassland) increases the impact of individual extensive areas.
Implementation	
Implementation period	Weeks: Extensive management practices can be well-integrated into land-use management. The aim should be to establish long-term strategies (at least 5 years).
Frequency	Recurring
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Depending on the measure, subsidies of €50-1000/ha may be available.
Socio-economic impacts	Low: Extensivisation of agriculture also enriches landscape appearance and hence its recreational value.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Extensivisation measures form part of cultural landscape/countryside management programmes and contractual nature conservation programmes, with appropriate subsidies for specific extensivisation measures.
Further information	
Evaluation	The provision of support for extensive agriculture is an established part of programmes for the conservation of the cultural landscape and contractual nature conservation programmes. Further information about funding conditions can be obtained from the relevant authorities and nature conservation organisations.
Information	Other: All relevant nature conservation and agricultural authorities.

Reduction or targeted use of fertiliser, pesticides and herbicides in agriculture

On fertilized areas biological diversity is often missing. © Thomas Max Müller/ pixelio.de

Involved sectors

Forestry, Water management, Nature protection

Affected habitats

Grassland, Arable land

Description

Appropriately managed agricultural spaces can act as stepping stone biotopes and connecting areas in a biotope network. As a rule, these areas, if they are to fulfil their function, must be managed extensively and in an ecologically compatible way. Non-use, or at least highly targeted use, of fertilisers, herbicides and pesticides encourages the development of appropriate characteristics and, even if no biotope networking strategy is in place, can help to introduce more biological diversity in the landscape matrix.

Impact

Impact in particular on	Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Large, intensively managed agricultural spaces contribute to landscape fragmentation. Reduction of inputs on these areas or extensivisation, especially with appropriate distribution of the areas concerned, can mitigate this impact.
Improvement or preservation of habitats	Non-use, or at least reduced use, of fertilisers, herbicides and pesticides preserves species diversity and enhances agricultural areas in ecological terms.
Element of ecological network	Especially if embedded in an overall concept, these areas serve as connecting elements and stepping stone biotopes.
Other	Can help to protect the hydrological regime and soils (erosion).

Time of realisation for measure	Immediate: The impact of non-use or reduction occurs immediately; the impacts on water and soil are more long-term in nature.
Impact scope	Very localised (plot): The impacts can be felt on the area concerned and in the locality (biodiversity).
Implementation	
Implementation period	Days: Generally entails a reduced workload.
Frequency	Recurring
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Cost savings result from reduced use; possibility of subsidies.
Socio-economic impacts	High: Positive impacts on water, soils, health. Farmers may experience reduced yields.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	The use of fertiliser, pesticides and herbicides in agriculture is regulated by legislation pertaining to agriculture and nature conservation.
Further information	
Evaluation	As part of biotope networking projects, these measures are only genuinely effective with proper planning and the involvement of many farmers. In Switzerland, however, positive experience has been gained in a number of projects, although compensation payments for farmers also play an important role here.
Information	Switzerland: Agricultural and nature conservation authorities, e.g. in Switzerland: http://www.bafu.admin.ch/

Species-Rich Grassland Programme

A list of meadow flowers enables to identify extensive species-rich grassland. © Rainer Sturm/ pixelio.de

Involved sectors

Agriculture, Tourism and leisure

Affected habitats

Bogs and fens, wetlands, Grassland

Description

The species inventory of a grassland reflects the way in which it is managed and its location. If the management method remains unchanged, the species composition will generally remain unchanged as well. This correlation opens up the opportunity to link subsidies for extensive grassland to the occurrence of key species of flora. In order to implement this innovative, results-oriented approach, a list of meadow flowers serves as a simple tool for reliable identification of extensive species-rich grassland. Promotion depends on the occurrence of certain easily identifiable plant species (indicator plants). Participating farmers undertake to preserve the species richness of their grasslands (meadows and pasturage). Farmers retain the choice of practices and resources to be used, so that biodiversity is not seen as a constraint: it calls upon their technical skills and sense of responsibility. They are also sensitised to issues such as nature conservation and biodiversity.

Impact

Impact in particular on Insects

Ecological impact

Improvement or preservation of habitats	With appropriate extensive management of meadows, species diversity of fauna as well as flora is increased.
Element of ecological network	With a sufficient number of areas and appropriate distribution as part of a biotope networking strategy, these meadows can become core and connecting elements of a biotope network.

Time of realisation for measure	Months: The positive impact on flora and fauna continues throughout the vegetation period.
Impact scope	Very localised (plot): The management method only has a direct impact on the plot concerned. For a corresponding impact in a biotope network, areas managed in this way must be appropriately distributed in line with an overall concept.
Implementation	
Implementation period	Days: To achieve the stated goal (species richness), extensivisation of agriculture is generally required, which also reduces workload.
Frequency	Non-recurring, Recurring: Long-term programmes desirable, but a single implemented measure can be effective.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): In the Regional Natural Park (PNR) of the Massif des Bauges in France, for example, the contract is remunerated with € 89/ha in all participating areas.
Socio-economic impacts	High: If tourism professionals are involved, this measure can add value to tourism (local products, flowering landscape, events such as meadow management competitions).
Sources of financing	Public: regional, Public: national, Public: European
Legal situation	Voluntary participation by farmers in the measure.
Further information	
Evaluation	The Species-Rich Grassland Programme has been under way in Baden-Württemberg (Germany) since 2002 and has proved very successful. Here, more than 10,000 farmers have participated in the scheme, which is funded by the MEKA II and III programmes. In France, a total of eight natural parks are experimenting with similar programmes. Experience in the Regional Natural Park (PNR) of the Massif des Bauges has been very positive, both from the farmers' and the Park's perspective.
Information	Other: Oppermann R., Gujer H.U. (ed.) (2003): Artenreiches Grünland bewerten und fördern - MEKA und ÖQV in der Praxis. Ulmer, 199 p.
Contact	France: Parc naturel régional du Massif des Bauges; contact: Philippe Mestelan

Good Practice	Project in the Regional Natural Park (PNR) of the Massif des Bauges, France Exemple du Parc naturel régional « Massif des Bauges », France Misura nel Parco naturale regionale “Massif des Bauges”, Francia

Agricultural field margin projects

Agricultural field margin with wild herbs. © Jan Freese/ pixelio.de

Involved sectors

Agriculture, Tourism and leisure, Nature protection

Affected habitats

Arable land

Description

Agricultural field margins are managed strips, a few metres wide, along agricultural fields. They are cultivated without the use of pesticides so that wild herbs and the fauna adapted to them are able to disperse and survive. In some cases, the strips are sown with a mixture of flowering plants (“blossoming belts”) or planted with shrubs and trees. The agricultural field margins not only provide a habitat for rare species of plant and contribute to the protection of soils and water resources; they also constitute important linear transit routes and form buffer zones between various forms of use.

Impact	
Impact in particular on	Small mammals, Reptiles, Amphibians, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	They form buffer zones between various forms of use, especially along well-used field paths and adjacent to ecologically valuable biotopes, and provide habitats for rare species.
Element of ecological network	Along fields and paths, the field margins form a network of linear connecting elements. Inclusion of these areas in local plans increases this impact significantly.
Other	On soils at risk of erosion or on cropland near waterways, positive impacts can be achieved in terms of soil and water protection and lowering of flood peaks.
Time of realisation for measure	Months: Field margins provide habitats all year round. Their main role, however, occurs after the cultivation of the fields in the vegetation period, when the wild herbs on the agricultural fields have achieved full growth.
Impact scope	Very localised (plot): The development of a local plan for the creation of agricultural field margins can greatly increase the impact of the measure by integrating individual sites into a broader network.
Implementation	
Implementation period	Days: The management and development of field margins can be well-integrated into routine land management. It is important to select site-appropriate species and to use indigenous seeds and plants of local origin.
Frequency	Non-recurring, Recurring: Long-term programmes are desirable, but an indiviual measure can be effective as well.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): The subsidy rates are established regionally. They mainly cover the loss of revenue resulting from set-aside and possible costs of seeding.
Socio-economic impacts	Medium: With their net-like structure in cleared agricultural landscapes, they create an appealing and diverse landscape appearance with increased recreational value.
Sources of financing	Public: local, Public: regional, Public: national, Public: European

Legal situation	Agricultural field margin projects exist in numerous regions. Regional or local guidelines specify the funding rates, application process, conditions for participation, contract period, monitoring procedures, sanctions etc.
Further information	
Evaluation	Implementation of the projects often fails due to excessive red tape. In many regions, however, these projects are being implemented very successfully, also as part of biotope networking initiatives, and adding value to tourism.
Information	Germany: Further information can be obtained from regional agencies (nature conservation and agriculture), e.g. in Baden-Württemberg (Germany).

Preservation, maintenance and replanting of hedges

Hedges are linear connecting elements of the biotope network © Yann Kohler

Involved sectors

Agriculture, Water management, Hunting, Spatial planning, Tourism and leisure, Nature protection

Affected habitats

Bogs and fens, wetlands, Grassland, Arable land

Description

Hedges are linear biotopes. They contribute to biodiversity and biotope connectivity, especially in heavily cleared landscapes with a small amount of, or no, forest or grassland. A healthy hedge with structural diversity provides a habitat for a large number of animals and is an important transit route for numerous small mammals and insects during migration and dispersion and when searching for food. Nowadays, hedgerows have virtually no commercial use and the trimming required for their regeneration tends not to take place. This means that a conscious decision must be taken to maintain the hedgerows as part of a biotope network as ageing hedges accommodate a far smaller number of species.

Impact

Impact in particular on	Small mammals, Reptiles, Amphibians, Birds, Insects
Ecological impact	
Reduction of fragmentation or creation of new valuable habitats	In cleared agricultural landscapes with large fields and land surfaces, hedges, as transit routes and ecological corridors, can reduce the fragmenting effect of the agricultural land.
Improvement or preservation of habitats	Hedges are very important habitats for numerous birds, insects, amphibians, spiders and also some species of mammals.
Element of ecological network	Due to their linear form, they act as 'transit routes' for birds and bats, for example, and in most cases, they are the only way for reptiles to survive migration. In a biotope network, e.g. with rock fragment piles or small bodies of water, the valuable ecological impact of hedges is increased further by spatial contact with other species.
Other	Hedges have a stabilising effect on the surrounding agricultural landscape, provide visual cover and some noise insulation and are thought attractive by people. They differ greatly from their surroundings in terms of exposure to sunlight, evaporation, temperature, soil moisture, air humidity and wind exposure.
Time of realisation for measure	Months: Depending on the type of hedge and technique used, replanted hedges take different amounts of time to fully develop and become populated by fauna. Their function as transit structures can be fulfilled relatively quickly.
Impact scope	Very localised (plot): The direct impact of hedges is very localised, however they can also gain regional importance when integrated in a biotope system.

Implementation

Implementation period	Days: To allow them to regenerate, the shrubs forming the hedges must be trimmed in sections every 10 to 20 years depending on the type of shrub. The margin must be maintained every 1 to 2 years.
Frequency	Recurring: Hedges must be maintained or cut back over the years.

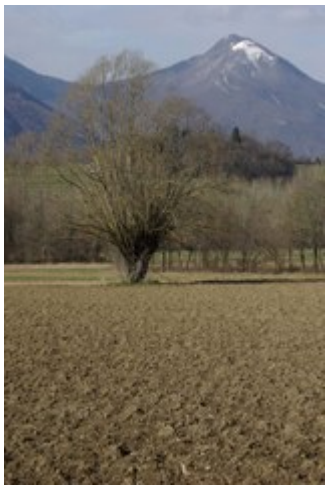
Economic and legal aspects

Costs	Low (1'000-10'000 EUR): Costs vary greatly depending on the different maintenance and planting or construction techniques.
Socio-economic impacts	Medium: Provision of wood without using any additional land, creation of regional value-added chains, preservation of yield increases from land near hedges, enhancement of the landscape for tourism.
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	In many regions the preservation, maintenance and replanting of hedges are supported by nature conservation or agricultural subsidies.

Further information

Evaluation	The positive impact of hedges in biotope network projects has been described in numerous scientific studies, whereby account must be taken of the objective of these biotope network projects here. Such investigations and strategies to maintain and valorise hedge landscapes exist in the Champsaur Valley, at the edge of the Ecrins National Park in France, for example.
Information	Other: Nature conservation societies, nature conservation departments in authorities, numerous regional biotope network projects (e.g. the Grand Marais (Grosses Moos) biotope network: http://www.biotopverbund.ch/)
Contact	Other: "Grosses Moos" project leader: Martin Johner Head of Scientific Department, Ecrins National Park: Richard Bone

Planting of individual trees or tree groups



In agricultural landscapes, individual trees or tree groups act as stepping stones. © Yann Kohler

Involved sectors

Agriculture, Spatial planning, Nature protection, Transport

Affected habitats

Grassland, Arable land

Description

Individual trees and small tree groups are a key element of the landscape and have high ecological significance. They provide habitats and refuge for many different animal species and are therefore valuable stepping stones in the biotope network. They also enrich the appearance of the landscape (e.g. by visually enhancing large areas of farmland) and increase its recreational value (e.g. by providing shade for seating areas). Due to their cultural and historical value, too (e.g. as symbols of peace, or where they had a role in the execution of justice), individual trees have landscape significance. Old trees in particular should be preserved in farmland, one reason being that their cavities provide particularly valuable micro-habitats. The planting of new trees should also be supported. Trees with a trunk circumference of at least 12-14 cm should be planted, and should be well-adapted to the chosen site.

Impact

Impact in particular on Small mammals, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Individual trees enhance the surrounding landscape and provide an important habitat for numerous species of fauna.

Element of ecological network	In open countryside and agricultural landscapes, individual trees constitute valuable stepping stones and thus play an important role in connecting isolated near-natural landscape elements.
Other	Beneficial to local climate.
Time of realisation for measure	Years: Newly planted trees develop their function in the biotope network with increasing age.
Impact scope	Local (municipality): Individual trees play an important role as stepping stones in the local biotope network.
Implementation	
Implementation period	Weeks: Prior to planting, meticulous planning is required; maintenance is essential after planting.
Frequency	Non-recurring: In addition, regular maintenance of the trees is needed.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Funding can be provided in some regions for individual trees and rows of trees on arable land (approx. € 20/tree); costs depending on size amount to approx. € 100-400/tree; cost of maintenance € 40-100/tree/year.
Socio-economic impacts	Low: Individual trees and groups of trees are valuable landscape-enriching elements and sources of food (fruit, blossom for tea) and of timber and fuelwood.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	In most regions, particularly large and ancient individual trees are often designated "natural monuments" or "protected landscape elements".
Further information	
Evaluation	The major importance of individual trees and groups of trees for nature conservation is apparent, inter alia, from their designation as protected landscape elements or natural monuments. Their importance for the biotope network is recognised and they are often promoted/protected within the framework of biotope network initiatives. They are also suitable as an element of an inner-city biotope network.
Information	Germany: More information can be obtained from the responsible nature conservation agencies and at: http://www.landwirtschaft-mlr.baden-wuerttemberg.de/servlet/PB/menu/1109685/index.html/

Creation and maintenance of dry stone walls

Walls made from rock fragments are important structural elements of the landscape. © Yann Kohler

Involved sectors

Agriculture, Spatial planning, Nature protection, Local population/citizens

Affected habitats

Shrubs and wooded areas, Bogs and fens, wetlands, Grassland, Arable land

Description

Dry stone walls are traditional landscape elements. They provide various types of habitat depending on their specific micro-climate, especially for thermophilous (warmth-loving) open-country species. The cracks in the walls, which are filled with fine earth, provide specific micro-habitats in which various plant communities and wild flora occur. Dry stone walls are also important habitats for insects, reptiles and amphibians, and provide breeding sites for birds (e.g. wheatears (Oenanthe), Black Redstart (Phoenicurus ochruros), Blue Tit (Cyanistes caeruleus), and Great Tit (Parus major)). They constitute valuable stepping stones and insular biotopes in the agricultural landscape and due to their linear structure, have a connective effect. Other near-natural structures such as pioneer areas and margins should also be preserved along dry stone walls.

Impact

Impact in particular on Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Promotion of typical plant species such as algae, lichens and mosses, moths and snails. Quiet areas and winter quarters for invertebrates and reptiles. Some species of wild bee (mason bee - Chalicodoma siculum) nest in the cracks in the walls.
Element of ecological network	Dry stone walls often have a corridor function and are important for connectivity. Their significance increases when linked to other near-natural landscape structures and they can, among other things, enhance structurally rich forest edges.

Time of realisation for measure	Immediate: Dry stone walls can be populated immediately after construction.
Impact scope	Local (municipality): Due to their impact as a stepping stone biotope, dry stone walls also play a role in regional biotope networks.
Implementation	
Implementation period	Weeks: The construction of new walls takes place from November to March, and damage is then monitored every year. Heavily overgrown walls should be partially cleared of shrubs, at least half of the wall should be left to grow wild and loose growth should be tolerated.
Frequency	Non-recurring: Regular maintenance of existing or new stone walls is needed.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Depending on the quality of the stones (one tonne per continuous metre), a new construction costs in the region of €310-470 per m2 (excluding excavation works), time expenditure: 2-4 m/day with experienced workers.
Socio-economic impacts	Low: With appropriate subsidies, the additional costs for building and maintaining dry stone walls will be low.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Subsidies for dry stone walls are possible through countryside management programmes and also within programmes for steep slopes (e.g. viticulture).
Further information	
Evaluation	Dry stone walls are regarded as important structural elements of the landscape and provide habitats for various species of flora and fauna. Their importance in the biotope network is increased when linked to other suitable near-natural landscape structures.
Information	Other: e.g. BirdLife: http://www.birdlife.ch/pdf/trockenmauern.pdf or: http://www.landwirtschaft-mlr.baden-wuerttemberg.de/servlet/PB/menu/1063566/index.html
Contact	Switzerland: Schweizer Vogelschutz SVS/BirdLife Schweiz

Creation, maintenance and preservation of rock fragment piles

Walls made from rock fragments are important structural elements of the landscape. © Yann Kohler

Involved sectors

Agriculture, Hunting, Nature protection, Local population/citizens

Affected habitats

Bogs and fens, wetlands, Grassland, Arable land

Description

Rock fragment piles are important structural elements of the landscape. From a nature conservation perspective, they constitute valuable stepping stones and insular biotopes in the agricultural landscape. A wide diversity of flora and fauna (insects, spiders, amphibians, reptiles and even small mammals) depend on these man-made habitats as their original habitats have disappeared in today's cultural landscape. These ecologically valuable structural elements must therefore form a key part of future landscape planning. As far as possible, the rock fragment piles should be created near waysides or forest edges or by hedgerows, not in an isolated position, in order to safeguard connectivity with a biotope network. Management involves occasional clearing of vegetation and, if necessary, re-stacking.

Impact

Impact in particular on Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Rock fragment piles provide resting places and habitats for various species of animals, as well as frost-proof winter quarters: the sand lizard (Lacerta agilis), the white wagtail (Motacilla alba alba), various species of mouse and also ground beetles, spiders, woodlice, snails, ants, bugs and wild bees.

Element of ecological network	Rock fragment piles constitute valuable stepping stones and insular biotopes in the agricultural landscape. In a biotope network with a hedge, for example, a spatial contact is produced and the valuable ecological impact is increased further.
Other	If the rock fragments are piled in a linear form, rock fragment walls emerge, which can be important as corridors.
Time of realisation for measure	Immediate: Rock fragment piles can be populated immediately after construction.
Impact scope	Very localised (plot): Most of the species that inhabit rock fragment piles have relatively small ranges. As a stepping stone biotope, however, rock fragment piles also have a part to play in a local biotope network.
Implementation	
Implementation period	Days: Building and maintaining rock fragment piles do not take very long. Occasionally they have to be cleared of vegetation and may have to be re-stacked.
Frequency	Non-recurring: Existing rock fragment piles need regular maintenance.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): The construction and maintenance of rock fragment piles are not expensive (a few hours of work per year). Subsidies amount to approx. €25 per rock fragment pile.
Socio-economic impacts	No direct impact
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	In many regions, rock fragment piles are protected by law. Their conservation is supported by nature conservation and/or agricultural subsidies.

Further information

Evaluation	The ecological importance of rock fragment piles for various species of flora and fauna has been recognised. Their significance in an ecological network comes mainly from the interaction with other landscape structures (hedges, streams, ponds, rock fragment walls etc.). They must also be integrated meaningfully into an overall strategy.
Information	Other: From various nature conservation organisations, the Nature and Biodiversity Conservation Union (NABU), the Federation for Environment and Nature Protection in Germany (BUND), Pro Natura, the French nature conservation organisation FRAPNA,…; and from the various regional administrations (nature conservation and agriculture departments).

Maintenance and preservation of mixed orchards

Mixed orchards are extremely species-rich habitats which require regular. © Yann Kohler

Involved sectors

Agriculture, Tourism and leisure, Nature protection, Municipalities

Affected habitats

Grassland, Arable land

Description

Mixed orchards are a characteristic and attractive feature of the cultural landscape in many Alpine regions and are among the most valuable patch biotopes. Due to the structural diversity in mixed orchards and the resulting diverse mosaic-type habitats, they provide a habitat for a wide range of species of flora and fauna. Scientific studies have shown that mixed orchards – unlike modern dwarf-tree intensive production systems – form very richly structured habitats with species-rich communities. As a result of their declining economic significance, and being fairly high-maintenance, however, more and more mixed orchards have been cleared in recent decades or have fallen victim to ageing. However, in intensively used agricultural landscapes, they constitute important connective structures in the local biotope network. The conservation measures for these areas must include arrangements for mowing, fertilising, management and maintenance, the preservation of ageing trees, etc.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Mixed orchards constitute habitats that are particularly rich in structures and species due to the diverse fruit varieties, the varying tree maturities and the various structures associated with meadows with an abundance of species and flowers. They accommodate up to 5000 species of flora and fauna.
Element of ecological network	They constitute important connective structures in the local biotope network, particularly in intensively used agricultural landscapes.
Other	Mixed orchards have a positive impact on the local climate due to their windbreak function and their cooling effect in summer. Soil protection and water pollution control, conservation of genetic diversity.
Time of realisation for measure	Long term: Their positive impact on flora and fauna comes mainly from their structural diversity: in the case of replanted orchards, this only occurs with time and in existing orchards it is only possible with regular, expert maintenance.
Impact scope	Local (municipality): In itself, a mixed orchard has a high ecological value as a patch biotope, which is increased significantly when it forms part of a network comprising several nearby areas.

Implementation

Implementation period	Weeks: The requisite expert maintaince of mixed orchards comprises several different and regular tasks throughout the year (mowing, pruning, harvesting, tree management, …)
Frequency	Recurring: Regular maintenance is needed for valuable stands of trees.

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): Replanting costs in the region of €2500-5000/ha depending on the planting method, preparatory measures, tree density etc. Depending on the land, number of trees and working time, subsidies or aid are granted for product marketing, which vary greatly from region to region.
Socio-economic impacts	Medium: On tourism through the enhancement of the landscape, on the regional economy and identity through local products (labels, old fruit varieties, juice etc.)
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	The Birds Directive and the Habitats Directive deal indirectly with the mixed orchard habitat. They specify a direction while the concrete implementation is based on the precise provisions of national laws, guidelines, promotion programmes and initiatives (in Bavaria, subsidies of approx. €5/tree, max. 100 trees/ha).

Further information

Evaluation	Various projects within the framework of the 'BayernNetzNatur' (Bavarian Nature Network) biotope network have shown that initiatives relating to mixed orchards not only have positive effects on the inhabitant flora and fauna, but also play an important role in issues such as regional value-added and development, the formation of regional networks, creation of identity etc., and that biotope network projects can be structured around such 'core initiatives'.
Information	Germany: From regional and national authorities (nature conservation, agriculture) and, for example, the "Streuobst 2000 Plus" initiative from the Bavarian agricultural authority to promote the cultivation of mixed orchards in Bavaria.
Contact	Germany: Expert: Stefan Kilian, Bavarian State Research Center of Agriculture, Institute for Agricultural Ecology, Organic Farming and Soil Protection (LFL-IAB)

Encouragement of unpaved paths

Unpaved, greened paths have a greatly reduced barrier effect. © Yann Kohler

Involved sectors

Agriculture, Forestry, Spatial planning, Tourism and leisure, Nature protection, Transport

Affected habitats

Forest, Grassland, Arable land

Description

Depending on their type and the way in which they are built, paths can have a low to high barrier effect. Pathway systems and their peripheral areas do not necessarily have a fragmenting effect on species of flora and fauna, however: if properly designed, they can also form important elements of the biotope network. They provide ways through the landscape and also form buffer zones to intensively farmed areas. From an ecological perspective, unpaved and “greened” paths and the strips of grass and vegetation, wooded areas, hollows, ditches etc. at their margins are extremely important. If the construction of new pathways is unavoidable, the need for sufficiently wide wayside areas should be taken into account during the planning process (at least 2.50 m wide grass and vegetation strips, at least 5 m wide wooded strips along pathways). Sunken paths and 'greened' dirt tracks, too, have diverse ecological functions as they provide many niches for flora and fauna with highly diverse requirements.

Impact

Impact in particular on	Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Reduction of the barrier effect of paths for insects (e.g. beetles and spiders)

Improvement or preservation of habitats	Unpaved paths are important for some bird species as well as brown hares (Lepus europaeus). Wet sites by paths are used by some species, e.g. as spawning areas for the yellow-bellied toad (Bombina variegata) or as a source of nesting material.
Element of ecological network	Unpaved paths constitute important elements of a biotope network, particularly in cleared agricultural landscapes, due to their linear structure, the valuable micro-habitats they provide and their margin and border areas.
Time of realisation for measure	Months: The new habitats created by the unpaved paths, or the near-natural design of existing pathways, are populated quickly.
Impact scope	Very localised (plot): In principle, the impact is more localised, but the measure can gain regional importance with a large scale approach.

Implementation

Implementation period	Weeks: The implementation periods of suitable measures depend on the situation at the outset. The measures can be integrated easily into new pathway projects.
Frequency	Non-recurring

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): The exact costs depend on the situation at the outset, and subsidies from countryside management programmes are sometimes possible.
Socio-economic impacts	Low: Unpaved paths are also more attractive for recreational use (hiking, mountain biking) and therefore have a high touristic value.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	The design of pathways is not directly governed by any laws, but the creation of near-natural pathways can be supported through close collaboration with the agriculture and forestry sectors, as well as through landscape planning (developing guiding principles).

Further information

Evaluation	Some examples show that, after the 'greening' of paths, there are more frequent occurences of animals such as rabbits/hares, butterflies and bees and even songbirds and birds of prey. Unpaved and 'greened' paths can also be advantageous for farmers as, in the long term, they can reduce the costs of controlling insects and mice in their fields. Diverse experiences have been made, e.g. in countryside management associations or nature conservation authorities. In Upper Austria, the preservation and development of paths with little paving have been defined as overarching goals in landscape planning.
Information	Austria: Upper Austria: Oberösterreich: http://www.land-oberoesterreich.gv.at/cps/rde/xchg/ooe/hs.xsl-/70510_DEU_HTML.htm
Contact	Austria: e.g. Office of the Government of Upper Austria, Department of Spatial Planning, Economic and Rural Development, Nature Conservation Division

Maintenance and restoration of traditional irrigation systems

Artificial water transportation systems are important landscape elements.
© Zaubervogel/ pixelio.de

Involved sectors

Agriculture, Water management, Spatial planning, Tourism and leisure, Nature protection

Affected habitats Grassland, Arable land

Description

As early as the Middle Ages, complex irrigation systems were created in various Alpine regions with low precipitation, in order to bring water from the mountains to the farmed areas in the valleys, often at some distance away. These artificial water transportation systems, often many kilometres in length (e.g. the “suonen” channels in Valais, Switzerland, the “acquedotti” in Val di Non (Trentino/Italy) and the “waale” in South Tyrol) are important landscape features with great significance for various associated habitats (lines of trees, mosaics of wet, semi-dry and dry sites). The conservation, restoration and maintenance of these elements are supported on a project basis or through the payment of maintenance premiums.

Impact in particular on Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	As a result of the abandonment of the irrigation systems, pipe installation and the use of sprinkler systems on farmland, important landscape structures and habitats that act as corridors or stepping stone biotopes in a functional ecosystem (e.g. lines of deciduous trees on dry slopes) are disappearing.
Element of ecological network	Due to their net-like structure, the irrigation systems form linear connecting elements in a biotope network.

Time of realisation for measure	Long term: This is a long-term measure whose initial outcomes can only be observed after several years as the associated flora and fauna only gradually become established and habitats take time to recover and develop.
Impact scope	Local (municipality): These measures are mainly suitable for implementation in regions where such irrigation systems and channels exist. Depending on the size of the system, the measures may affect individual municipalities or entire regions.
Implementation	
Implementation period	Months: Maintenance, repair and management measures are long-term activities.
Frequency	Recurring: Requires implementation of long-term measures.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): In South Tyrol, for example, maintenance of the “waale” receives an amount up to a maximum of 70% of recognised projected costs.
Socio-economic impacts	Medium: In the tourism sector, may be marketed successfully as part of a hiking trail concept (e.g. the Waalweg paths in South Tyrol).
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	The management and restoration of traditional irrigation systems are funded by agricultural and/or nature conservation programmes in various areas.
Further information	
Evaluation	Experience has been gained in South Tyrol, which has the most extensive system in the Alpine region, Valais, Switzerland, and elsewhere.
Information	Other: Information about contributions to landscape management in South Tyrol: Amt für Natur- und Landschaft (Office of Nature and Landscape) http://www.provinz.bz.it/natur/index_d.asp/ Project: "Kulturlandschaft Zeneggen 2000" (Cultural Landscape Zeneggen 2000) http://www.zeneggen.ch/
Contact	Italy: e.g. Amt für Natur- und Landschaft (Office of Nature and Landscape), South Tyrol

Grazing projects - landscape conservation with sheep

Traditional pasturing with sheep cultivates areas in a sustainable way. © www.sxc.hu

Involved sectors

Agriculture, Tourism and leisure, Nature protection, Other: Countryside management, Associations, Districts and other local authorities

Affected habitats

Bogs and fens, wetlands, Grassland

Description

For a biotope network with nutrient-poor and dry sites, sheep grazing plays a key role. Due to their lack of economic viability using conventional cultivation methods, there is often a risk that these valuable biotopes will cease to be managed and maintained. Furthermore, these areas are in many cases being drastically reduced, with remaining oligotrophic grasslands often becoming isolated. Site gradients are being lost, successional processes terminate at stages of maturity, and there is a lack of new pioneer sites. Traditional grazing using sheep can ensure the sustainable management of these sites. To this end, testing and development of practicable area management methods are required in cooperation with sheep farmers and landowners.

Impact

Impact in particular on	Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Tests using plant seeds have shown that the diaspores can been found in sheep's wool for a period of several months. Species and gene exchanges can take place in this way, or a new population of a species can occur, even between areas that are kilometres apart.
Improvement or preservation of habitats	In grazed areas, certain plant species are promoted through the browsing and feet of the sheep while others are decimated. Overall, these processes are more dynamic than mowing. Bush encroachment is prevented in these areas.

Element of ecological network	Grazing performs an important function in the biotope network. Flocks of sheep can promote the dispersion of species between individual areas by transporting diaspores and, in rarer cases, even small animals. This can be very important for the exchange of genes and species between isolated areas.
Time of realisation for measure	Immediate: The direct impact of the grazing on the land, as well as the indirect impact from the transport function performed by the sheep, occur immediately after grazing is commenced.
Impact scope	Regional: Regional strategies must be produced to enable sufficient grazing land to be provided for the sheep and achieve connectivity effects through migratory grazing.
Implementation	
Implementation period	Months: During the vegetation period, the flocks of sheep are herded along tracks from one area requiring treatment to the next in accordance with a fixed grazing plan.
Frequency	Recurring: Optimal solution: integrate in a long-term regional grazing concept.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): The costs of sheep grazing are around €175-385/ha/year.
Socio-economic impacts	High: The products from sheep farming (wool, meat, dairy products) provide regional value-added. Sheep farming jobs are created.
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional
Legal situation	Grazing can be supported at local and regional level by means of contract-based nature conservation and maintenance premiums (approx. €160-260/ha/year).
Further information	
Evaluation	Plants and animals use sheep for transport. A roving flock of sheep can reduce isolation effects in many ways: on the one hand, the tracks create connectivity between the areas, and on the other, the wandering flock of sheep can act as a living biotope network by transporting various organisms in their wool or hooves.
Information	Germany: e.g. the grazing strategy from the Bavarian Environment Agency in the Lech valley (http://www.lfu.bayern.de/)
Contact	Germany: 'Lebensraum Lechtal (the habitat of the Lech valley) project management: http://www.lebensraum-lechtal.de/

Maintenance of open areas by controlled burning

Targeted and expert “controlled burning” can help to preserve an open landscape. © Yann Kohler

Involved sectors

Agriculture, Nature protection, Other: Countryside management associations

Affected habitats

Grassland

Description

Open-country habitats such as embankments in wine-growing areas or terraced landscapes, dry grasslands, heaths or peat bogs are ecologically valuable areas. However, as they are often only of marginal suitability for agricultural use, and are costly and time-consuming to maintain, they are at risk from bush encroachment or the occurrence of problematical vegetation (e.g. Goldenrod (Solidago virgaurea) and blackberry). This impacts on the appearance of the landscape and on the ecological functionality of these areas. The maintenance of these areas through controlled burning may be a viable and cost-effective option here. However, this management technique will only be successful, from a nature conservation and technical perspective, if the personnel undertaking the measure are properly trained, as practical implementation of controlled burning requires strict adherence to procedural guidelines.

Impact

Impact in particular on Small mammals, Insects

Ecological impact

Improvement or preservation of habitats	Burning as a method of managing embankments and other sites helps to maintain an open landscape and therefore also open-country habitats such as dry grasslands, sandy dry vegetation, montane dry grasslands, heath and peat bogs.

Element of ecological network	Open linear spaces such as embankments in managed cultural landscapes form complex networks which can act as connecting elements in a biotope network. Patches of woodland and shrubs increase this effect.
Time of realisation for measure	Immediate: The regeneration and recolonisation of the managed areas take place during the vegetation period. Once the area offers some cover, it can be used as a corridor.
Impact scope	Very localised (plot): When individual sites are managed in this way, the impact remains very localised. However, if several spaces undergo this form of management as part of a broader strategy, important stepping stone biotopes and connecting elements are created.
Implementation	
Implementation period	Days: Controlled burning on specific areas is very swift. However, this management measure should be embedded in a local or regional strategy, and depending on the number of sites to be managed, may be fairly time-consuming.
Frequency	Recurring: To ensure this in the long run, burning must be repeated over a number of years and must be part of an overall concept.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): The costs of controlled burning amount to approx. ca. € 50-150/ha, so generally, it is up to 50% cheaper than other management options.
Socio-economic impacts	Low: In areas with a structurally rich, open cultivated landscape, controlled burning can help to preserve the landscape appearance. Savings made due to lower implementation costs.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	Burning must comply with local nature conservation and agricultural legislation.

Further information

Evaluation	The outcomes of trials in Baden-Wuerttemberg, for example, which have been carried out for around 25 years, indicate that controlled burning has a role to play in maintaining open grasslands, their structure and species diversity. However, ensuring that farmers comply with the guidelines on controlled burning may be problematical and may lead to conflicts with nature conservation objectives and the local community.
Information	Germany: Global Fire Monitoring Center (GFMC) http://www.fire.uni-freiburg.de/
Contact	Germany: Prof. Dr. Johann G. Goldammer, Head of Fire Ecology Research Group, University of Freiburg

Tree maintenance and preservation of pollarded trees

A freshly pollarded willow. © Yann Kohler

Involved sectors

Agriculture, Water management, Nature protection, Local population/citizens

Affected habitats

Shrubs and wooded areas, Grassland, Arable land

Description

Pollarded willows are characteristic elements of the landscape in various Alpine regions. The unusual shape of the heads of the trees is created when the young trunks and main branches are cut back to promote a more bushy growth of foliage. At the head of the trunk, cavities are formed over time, and in the branches, the bark and especially the cavities, numerous species find a habitat and niches in which to breed. As many as 200 species of fauna can occur in the willows found in intact river meadows, for example. In the past, pollarded willows provided a source of wood, e.g. for fencing, shafts for tools, bindings for wine, basket-making etc., but they have no current value from this perspective today. In the context of large-scale agriculture, too, stands of pollarded willows are often regarded as a nuisance and are therefore removed. The management of pollarded willows is time-consuming and labour-intensive, and if they are not maintained, the trees often break apart. In networks of interlinked biotopes, they constitute important stepping stones and transit routes.

Impact

Impact in particular on	Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Regular cutting of the willows results in rapid thickening of the trunk, with areas of decay and cavities developing at the upper end as the years pass. In the cracks, niches and hollows of these old stands of pollarded trees, numerous species of small mammals, insects and birds etc. find a habitat and niches in which to breed.
Element of ecological network	As linear structures, e.g. along small watercourses, they can act as transit routes. As isolate trees they form important stepping stones in the cultural landscape.
Other	Pollarded willows are suitable for use to reinforce ditches and banks and can thus replace masonry in the rehabilitation of watercourses to some extent.
Time of realisation for measure	Immediate: Pollarded trees develop their habitat and stepping stone biotope function with increasing age.
Impact scope	Very localised (plot): As part of a local or regional strategy for the management of the pollarded trees, the biotope networking impact can be substantially increased.

Implementation

Implementation period	Days: Caring for the trees is time-consuming and labour-intensive. Managing a large number of trees is likely to be fairly time-consuming. Regular cutting only takes place every 8-10 years, however, so that the management can be spread over a number of years.
Frequency	Recurring: The characteristic shape of pollarded trees will result from regular pruning every 5-20 years.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Subsidies can amount to around € 25-30 per tree.
Socio-economic impacts	Medium: Pollarded willows provided a source of wood, e.g. for fencing, shafts for brooms, bean poles, bindings for wine, basket-making, firewood, etc.. This has decreased in significance but is now being revived in local projects. The wood is used in schools and kindergartens as a material to build play tunnels, lattice fencing, etc. Willow rods can also be used in private gardens and for reinforcing banks in "green" hydraulic engineering.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	Management, maintenance and new planting of pollarded willows are subsidised in various Alpine regions. In some regions, these trees enjoy protect status as significant elements of the cultural landscape.

Further information

Evaluation	Pollarded trees are important and particularly striking features of a cultural landscape and are closely linked with various traditional forms of use. For that reason, in addition to their ecological function, it is important to integrate them into biotope networking strategies. They can develop symbolic significance for entire projects (see project run by Burgenland Society for Nature Conservation).
Information	Other: Braun, Konold (1998): Kulturgeschichte und Bedeutung der Kopfweiden in Südwestdeutschland. Beiheft 89, Veröffentlichungen für Naturschutz und Landschaftspflege in Baden-Württemberg. 240 p.
Contact	Austria: e.g. Pollarded tree project run by Burgenland Society for Nature Conservation: http://www.naturschutzbund.at/burgenland/

Forestry

Creation of forest reserves

Cross-linked forests are important for a biotope network. © Maja Dumat/ pixelio.de

Involved sectors

Agriculture, Forestry, Nature protection

Affected habitats

Forest

Description

Areas of woodland which are particularly valuable in nature conservation terms are important elements of a biotope network; these include areas with remnants of potential natural vegetation, old-growth forest, coppice forest and special sites (river-meadow and humid forests, gorges, steep slopes). Natural forest reserves can constitute an important tool in maintaining a representative network of forested areas of appropriate quality. Here, the various stages in the development of forest structures and their typical fauna and flora can be maintained, without use, in the various natural forest communities and habitat types. They also act as significant biotopes or stepping stones in a more or less non-natural environment (especially forests on valley floors, (former) river-meadow forests).

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	The maintenance of near-natural forested areas without use improves habitat quality for typical and in some cases rare species of fauna (natural processes of forest dynamics, typical species inventory). Forested areas with low levels of disturbance and fragmentation are maintained.
Element of ecological network	With close connectivity with other valuable habitats (dry meadows, fens, high bogs, flood plains), forest reserves act as significant biotopes, stepping stones or connecting corridors in a more less non-natural environment.
Time of realisation for measure	Years: Depending on the starting conditions in the forest stand, a near-natural state may have to be established first.
Impact scope	Local (municipality): Local planning can increase the impact of the measure as individual areas can then be integrated into a broader network (other forested areas, valuable habitats outside the forest).

Implementation

Implementation period	Months: The administrative process associated with designation as a forest reserve usually takes some time.
Frequency	Non-recurring

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): Financial support is usually provided as a basic amount (approx.€ 15/ha) + a flat rate for default on contract (up to € 340/ha).

Socio-economic impacts	Low: Legislation on forests and nature conservation governs the payment of compensation for forest reserves.
Sources of financing	Private sponsor, Public: local, Public: regional, Public: national, Public: European
Legal situation	In most cases, a representative network of natural forest reserves (also: natural forest cells, forest reserves, etc.) is covered by individual legislation applicable to forests. Forest reserves are usually established as a contract-based model with voluntary participation.
Further information	
Evaluation	Natural forest reserves exist in Germany, Austria and Switzerland, for example, where they are well-established as contributions to nature conservation. Information can be obtained from the relevant authorities and various nature conservation organisations.
Information	Switzerland: e.g. St. Gallen's forest reserve strategy: http://www.wald.sg.ch/home/forstdienst/forstorganisation-/waldregionen0/waldregion_4_see/waldreservate.html

Calming measures for forests that merit protection

Calming of forested areas improves habitat quality for typical and in some cases rare species of fauna. © Rainer Sturm/ pixelio.de

Involved sectors

Forestry, Hunting, Spatial planning, Tourism and leisure, Nature protection, Other:

Affected habitats

Forest

Description

Forests are increasingly being used for recreational and leisure purposes by individuals and groups seeking an experience of nature. This can have negative impacts (e.g. noise, creation of informal pathways), especially in forested areas which are valuable from a nature conservation perspective and which form important elements of a biotope network. Areas with remnants of potential natural vegetation, old-growth forest, coppice forest and special sites (river-meadow and humid forests, gorges, steep slopes) are particularly valuable in nature conservation terms and should be kept free from negative influences as far as possible. As a way of calming these areas, various measures can be adopted, including the targeted creation of circular pathways and infrastructural services (visitor and parking facilities) in areas of woodland which are less in need of protection, as well as the production of information boards and brochures and the development of educational pathways.

Impact

Impact in particular on Small mammals, Big mammals, Birds

Ecological impact

Improvement or preservation of habitats	Calming of forested areas improves habitat quality for typical and in some cases rare species of fauna.

Element of ecological network	Forested areas which have undergone calming measures are important refuge areas and are therefore very important elements of the biotope network. Corresponding measures can also be carried out in peri-urban areas (targeted calming of individual forested areas).
Time of realisation for measure	Immediate: Measures can start to have positive impacts very quickly. However, experience has shown that it takes some time for the measures to be accepted by all user groups.
Impact scope	Local (municipality): Channellling masures should be planned on a broader spatial basis as otherwise, conflicts will simply be shifted to neighbouring areas.
Implementation	
Implementation period	Months: Strategies for the channelling of visitors require comprehensive planning. Stakeholders must be involved from the outset in order to increase acceptance.
Frequency	Recurring: For higher effectiveness, long-term action adapted to emerging needs is required.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Due to the long planning period and the sometimes cost-intensive measures (infrastructure), several thousands of euros must be reckoned with, depending on the activities being planned.
Socio-economic impacts	Low: Attractive educational pathways and circular pathways can add value to tourism and also be utilised for environmental education purposes.
Sources of financing	Private sponsor, Public: local, Public: regional, Public: national, Public: European
Legal situation	Strategies for visitor channelling should be integrated into landscape and protected area planning (e.g. including Natura 2000 sites). Measures may also be eligible for funding under rural development programmes.
Further information	
Evaluation	The awareness of the need for visitor channelling measures has increased considerably in recent years. Relevant strategies already exist in protected areas of various categories. Strategies for targeted channelling of visitors are already in place in peri-urban woodland in particular.

Information	Germany: e.g. http://www.biosphaerenreservat-vessertal.de/projekte/blenkung/einf.htm Project in the Bavarian Alps (Allgäu): http://www.dbu.de/PDF-Files/A-19778.pdf

Maintenance and management of coppice forests

Coppice forests are particularly species-rich habitats. © Gerhard Elsner

Involved sectors

Agriculture, Forestry, Nature protection

Affected habitats

Forest

Description

Coppice forests are particularly species-rich habitats and make a contribution to the preservation of cultural and historical diversity. Newly coppiced areas of woodland are sunny spaces which are notable for their diverse habitat mosaic in a relatively small space. They thus contain important habitats for many species of flora and insects, as well as the Sand Lizard (Lacerta agilis) and Green Woodpecker (Picus viridis), and provide substitute habitats for the Hazel Grouse (Bonasa bonasia). Regular cutting on 3- to a maximum of 40-year-old rotation areas can improve the species inventory by promoting structural diversity and, in intensively used farmland, can serve as a stepping stone in the biotope network. Oak, birch, hornbeam, sycamore, black locust, sweet chestnut and black alder are the main species of tree found at colline to sub-montane altitudes. Coppice forests also play a major role in river-related ecosystems (e.g. grey alder coppice forests) and are particularly important elements of a biotope network here.

Impact

Impact in particular on	Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Coppice forests are important habitats for many rare species of flora and fauna, including Hazel Grouse and especially thermophilous (warmth-loving) species.
Element of ecological network	Use of coppice stands along linear structures (paths, roads, embankments) can form elements of a biotope network.
Time of realisation for measure	Years: Relatively swift impact can be expected from the management of existing coppices; where new coppice forests are created, the related structures develop with increasing age of the stand.
Impact scope	Local (municipality): By linking measures to wider biotope network planning (e.g. connectivity with fallow land with bushes, and with hedges, oligotrophic grasslands, edges etc.), the impact can be increased.

Implementation

Implementation period	Weeks: Relevant measures can be implemented fairly swiftly.
Frequency	Recurring: The typical structure is a result of regular use.

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): If wood from coppice forests is used for energy purposes, profits outweigh the costs of the relevant measures.

Socio-economic impacts	Low: Coppice forests can be used as renewable energy sources with corresponding economic value-added.
Sources of financing	Private sponsor, Public: local, Public: regional, Public: national, Public: European
Legal situation	Measures for the maintenance of coppice forest may be eligible for funding within the framework of contractual nature conservation programmes in the forestry sector (e.g. "Nature Conservation in Forests" programme in Switzerland).
Further information	
Evaluation	There are some examples of the integration of coppice forests into biotope networks. Various current research projects are under way to explore the potential for energy use of coppice forest stands.
Information	Other: Project examples, e.g. at http://rohrhardsberg-life.de/artikel/niederwaelder or: http://www.baselland.ch/naturschutz_wald-htm.310132.0.html

Extraction of timber: conserving stocks and soils

The use of horses causes less damage to stands and regeneration areas. © www.agrar.steiermark.at

Involved sectors

Forestry

Affected habitats

Forest

Description

Extraction of timber is a major intervention in forest stocks and inevitably causes disturbance to flora and fauna. Despite careful planning and implementation, it is impossible to avoid damage to the remaining stands. Known as skidding damage, this can have sometimes considerable negative impacts on individual trees and on forest stands. Furthermore, extraction often also involves the creation of forestry roads, which have a fragmenting effect. In terms of landscape permeability, alternative methods of extraction (e.g. cable logging, horse logging etc.) should be given preference. The use of horses, in particular, causes less damage to stands and regeneration areas, and protects the forest floor as it does not leave tracks or cause widespread compaction of soils or oil pollution etc. Horses can also be used on slopes, and if sledges are used, can continue in winter.

Impact

Impact in particular on	Small mammals, Birds

Ecological impact

Improvement or preservation of habitats	Negative effects of timber extraction (including noise) are reduced by the deployment of less damaging extraction methods.
Other	Less damaging timber extraction methods make a contribution to soil protection and water pollution control.
Time of realisation for measure	Immediate: Positive effects are noticeable immediately.
Impact scope	Very localised (plot): The measure has a very localised impact in the direct timber extraction area. A large-scale approach increases the scope of impact accordingly.

Implementation

Implementation period	Days: The measure can be integrated easily into timber extraction activities.
Frequency	Non-recurring

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): In Austria, depending on the forest's function, subsidies are available for up to 50-70% (at maximum extraction costs of €40 per solid cubic metre) of the costs when horses are used.
Socio-economic impacts	Low: Depending on the conditions in the territory and the situation at the outset, the use of horses can be more economical, and financial aid may also be also available.

Sources of financing	Private sponsor, Public: local, Public: regional, Public: national, Public: European
Legal situation	Subsidies are available for the use of horses in the preliminary clearing activities required for regeneration, as well as in small-scale clear cutting activities to promote already existing natural regeneration.
Further information	
Evaluation	Currently, horses are only used infrequently for timber extraction, and the experiences are available from the state forestry administrations concerned.
Information	Other: e.g. from the forestry authorities in question.

Conservation of ecologically significant trees i.e. trees with holes

Old and dead trees are important habitats. © Hubertus Schwarzentraub

Involved sectors

Forestry, Nature protection, Local population/citizens

Affected habitats

Forest

Description

In a commercial forest, besides the creation and maintenance of old-growth and deadwood islands, the conservation of specific individual trees (nest and hollow trees, trees with rotten sections or fungal infections, or bizarre trees) in the forest stand plays an important role. Between the old-growth and deadwood islands, these individual trees serve as stepping stones or transitional biotopes, especially for less mobile species of fauna in search of new habitats. These trees are particularly important in intensively used forest stands. They also help to safeguard, in the medium to long term, a sufficient high proportion of biotope trees in the forest. The definition of the number, distribution, species and characteristics of these trees must take place in line with local conditions.

Impact

Impact in particular on	Small mammals, Birds, Insects

Ecological impact

Improvement or preservation of habitats	The trees enhance the forest biotope and provide a habitat for flora, fungi and fauna (nesting places, deadwood for insects, etc.).
Element of ecological network	Between the old-growth and deadwood islands, these individual trees serve as stepping stones or transitional biotopes, especially for less mobile species of fauna in search of new habitats.
Time of realisation for measure	Immediate: Depending on the age of the selected trees, they can take on this role immediately or over the long term. The processes of ageing and decay take many years.
Impact scope	Local (municipality): With a sufficient number of trees, appropriately distributed, good local impacts can be achieved.

Implementation

Implementation period	Days: The selection of trees takes place as part of normal inventory work or during marking of trees for felling; no further work is involved afterwards.
Frequency	Recurring: Requires regular management or adaptation and careful land management.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Subsidies can amount to €40-80 per trunk/p.a. depending on species and number of trees.
Socio-economic impacts	Low: Possible loss of revenue through non-use, but this can be compensated regionally from subsidies.
Sources of financing	Public: local, Public: regional, Public: national, Public: European

Legal situation	Safety obligations established in law must be complied with during site selection.
Further information	
Evaluation	The positive impacts of old-growth and deadwood, including isolate trees, in the forest stand are scientifically proven and are thus an integral part of sustainable forestry and various certification procedures. They are one of the most important elements of ecoconnectivity in the forest.
Information	Other: Information is available from: http://www.waldwissen.net/ and various forestry authorities.

Conservation and development of old-growth and deadwood islands

Old-growth and deadwood islands are important habitats for numerous animal and plant species. © soquett/ pixelio.de

Involved sectors

Forestry, Hunting, Nature protection

Affected habitats

Forest

Description

In the normal commercial forest, trees are grown for optimum timber quality and are felled before they reach biological maturity. However, many species of flora and fauna are dependent on old, very old and even dead trees. In areas of woodland, groups of trees should therefore be preserved beyond the commercial cutting interval in order to create old-growth and deadwood habitats. These old-growth and deadwood islands also perform an important role in ecological connectivity.

Impact

Impact in particular on	Small mammals, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Old-growth forest and dead trees provide a habitat for a variety of insects and species of bird.
Element of ecological network	By designating old-growth forests rich in deadwood as part of a biotope network, important stepping stone biotopes can be created for rare species (e.g. Three-toed Woodpecker (Picoides tridactylus), various species of bat ...).
Time of realisation for measure	Long term: Old-growth and deadwood islands develop slowly as part of the development of stands. The associated fauna, too, only becomes established over the long term.
Impact scope	Local (municipality): A network of old-growth stands and deadwood islands with a mesh width of approx. 500 m should be developed at municipal or, if possible, at regional level in order to achieve genuine impacts as part of a biotope network.

Implementation

Implementation period	Long term: Old-growth and deadwood islands must be planned and developed as part of the stand over the long term within the framework of forest management.
Frequency	Recurring: Requires regular care or adaptation and careful management.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): No costs. In some regions, financial support is provided for the conservation of old-growth and deadwood.

Socio-economic impacts	Low: Income loss due to delayed use or non-use of the affected trees.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	As a rule, these are voluntary measures but may be mandatory in some certified forests.
Further information	
Evaluation	In order to achieve a good impact as part of a biotope networking project, the measure must be implemented across a relatively large area with equal distribution of "island" spaces.
Information	Other: A wealth of information is available on the Internet site: http://www.waldwissen.net/, which covers a range of forest-related topics.

Structurally rich forest edges

Structured forest edges have hedges and other structural elements. © B. Stolze/ pixelio.de

Involved sectors

Agriculture, Forestry, Hunting, Nature protection, Other: Schools

Affected habitats

Forest

Description

The edges of forests and woodland are often located next to agricultural areas, lakes or rivers, open meadows, pasturage or roads and railways. Together with other structural elements such as hedges, forest strips or riparian strips, they are an important element of a biotope network. Due to their function as transitional zones, they provide a place of refuge and particularly valuable habitats (e.g. for rarer species of deciduous tree or shrubs). They are also important as stepping stone biotopes, e.g. for wild bees, beetles, bats, birds and hedgehogs. Valuable forest edges comprise a shelterbelt, shrub belt and herbaceous fringe. These three components vary in age and are layered and irregular in structure. They require regular management measures.

Impact

Impact in particular on Small mammals, Big mammals, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Layered and structurally rich forest edges are valuable biotopes which provide a habitat for many rare species. They enhance the habitat of wild animals in particular.
Element of ecological network	Forest edges are an important element of the cultural landscape and due to their linear structure in transitional zones are important for networks of interlinked biotopes. They can also be enriched with dry stone walls.
Other	Stabilising impact on tree stands.

Time of realisation for measure	Years: The desired structure will not develop until 5-10 years after the first targeted management measures to create a structurally rich forest margin.
Impact scope	Local (municipality): Relevant measures may also have an impact beyond the immediate locality.
Implementation	
Implementation period	Weeks: The duration of measures depends on the type and intensity of intervention.
Frequency	Recurring: The typical structure can only be developed through regular maintenance.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Subsidies are available for this type of forest management measure. The costs of managing forest margins amount to approx. € 2000/100 m (width 30 m).
Socio-economic impacts	Low: An intact forest margin has positive impacts on forestry, as it reduces the risk of windthrow or breakage. Material resulting from management measures can be used for heat energy.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	Enhancement of forest margins can be integrated into management planning by local forest enterprises and at higher level and take place within the framework of forest management. It can also be included in landscape planning and management.
Further information	
Evaluation	The importance of structurally rich forest margins for flora and fauna and as an element of the biotope network is substantiated and in some cases is already included in framework strategies for nature conservation in forests. Relevant examples can be provided by forestry agencies and enterprises and nature conservation organisations.
Information	Switzerland: e.g. Amt für Wald (Forestry Office) Graubünden, Switzerland http://www.wald.gr.ch/download/waldrand.pdf

Transport

Measures for seasonal amphibian migration

Every year millions of amphibians get run over by cars. © Michael Wittstock/pixelio.de

Involved sectors

Agriculture, Water management, Tourism and leisure, Nature protection, Transport, Local population/citizens, Municipalities

Affected habitats

Areas for settlements and transport

Description

Most amphibians in Central Europe undertake various migrations during their lives, including the seasonal spring migrations to their spawning grounds. They invariably encounter numerous barriers which they must overcome, especially the dense transport network where millions of amphibians are killed by vehicles every year. There are many measures which could be taken to protect amphibians during migration and to help reduce the barrier effects; these include warning signs for drivers; mobile seasonal fences for amphibians; substitute spawning grounds; temporary road closures; and permanent protection systems (amphibian tunnels), etc.

Impact

Impact in particular on	Amphibians

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	The purpose of the measures is to reduce the fragmentation effects for amphibians during migration and facilitate habitat access.
Improvement or preservation of habitats	Amphibians prefer suitable habitats for their migrations. Habitat improvement measures should therefore be carried out in parallel.

Element of ecological network	Most of the actions carried out are "short-term" elements of a biotope network, with human intervention substituting for a corridor. In most cases, however, the measures are simply a response to an acute danger, not a permanent solution.
Time of realisation for measure	Immediate: The actions last for the duration of the spring migrations. They must have immediate impact and mitigate the acute danger.
Impact scope	Very localised (plot): Amphibians do not have very large ranges. The measures are generally carried out at local/municipal level.
Implementation	
Implementation period	Weeks: Speed limits, mobile fences, warning signs etc. are used for several weeks during the peak of the migration (usually 6 weeks).
Frequency	Non-recurring, Recurring: Permanently installed crossings for amphibians plus mobile facilities to be set up and managed during migrations of amphibians.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Vary widely depending on the measure. Work is often carried out by volunteers.
Socio-economic impacts	No direct impact: Possible prevention of traffic accidents. Often, sensitisation of the general public.
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional
Legal situation	These are voluntary actions which must, however, respect general traffic safety provisions.
Further information	
Evaluation	The measures described are generally not a permanent solution for improving connectivity. More permanent solutions are removal of trunk status from roads, decommissioning of roads, possible night-time road closures in spring and autumn or year round, or permanent protection systems such as underpasses for small animals.
Information	Switzerland: e.g. Swiss Centre for Amphibian and Reptile Conservation (KARCH)
Contact	Other: Various nature conservation organisations.

Corridors for small animals

While building streets one has to think of amphibians and small animals.
© Conseil Général Isère

Involved sectors

Forestry, Hunting, Nature protection, Transport, Local population/citizens

Affected habitats

Areas for settlements and transport

Description

Underpasses for small animals are pipes made from concrete or steel which are incorporated into the road-body crossways or at angles as crossing aids for small mammals, amphibians, reptiles and invertebrates. Conduits obstruct animals' free access to the road and lead them to the underpasses. An uninterrupted link between the conduits and the underpasses is essential. The conduits should run parallel to the road, and should if possible be supplemented with guide structures placed at right-angles to the tunnel openings. These crossing aids for amphibians and small animals should be incorporated at an early stage during road-building and should be ready for operation before traffic is permitted to use the road. Retrofitting of these systems is rarely possible due to the high costs involved. The advantage of these permanent protection systems is that they work all year round and require very little management.

Impact

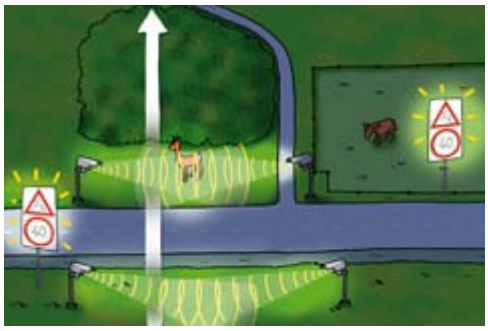
Impact in particular on	Small mammals, Reptiles, Amphibians, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	If properly planned and implemented, underpasses for small animals can greatly reduce the fragmentation effects of linear infrastructure systems.
Other	The installations can greatly reduce the number of animals killed on the roads, especially during seasonal amphibian migrations, and thus have positive impacts on populations.

Time of realisation for measure	Immediate: As soon as the system is installed on the affected section of road, guide structures lead the animals to the underpasses.
Impact scope	Local (municipality): As most of the target species have relatively small ranges, the impact is generally fairly localised.
Implementation	
Implementation period	Weeks: Particularly sensitive sections of existing roads are generally well-known. When installing new systems, studies are required. Installation can take place fairly rapidly.
Frequency	Non-recurring: Installation a single activity, but regular care and checks are essential.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Relatively low costs if installed during road-building; retrofitting is very complex and expensive.
Socio-economic impacts	No direct impact
Sources of financing	Public: local, Public: regional, Public: European
Further information	
Evaluation	Thanks to the conduits and guide structures, the underpasses are generally very effective and are used by a wide variety of animal species.
Information	Other: Nature conservation associations, especially those working with amphibians and involved in the seasonal amphibian migrations.
Contact	Other: e.g. NABU, WWF, Pro Natura.

Wildlife warning systems to avoid wildlife collisions



Installation of warning systems for the prevention of accidents involving deer at known deer crossing points. © Conséil d'Isère

Involved sectors

Forestry, Hunting, Spatial planning, Nature protection, Transport

Affected habitats

Areas for settlements and transport

Description

This involves the installation of warning systems for the prevention of accidents involving deer at known deer crossing points. A network of infrared sensors covers both sides of the road to a distance of around 300 m. If an animal enters this area, it is detected by the sensors. These send an impulse to a traffic warning signal which lights up and warns approaching drivers of the immediate danger.

Impact

Impact in particular on	Big mammals
Ecological impact	
Reduction of fragmentation or creation of new valuable habitats	Does not mitigate the barrier effect of a road. However, it is a very effective method of reducing the number of accidents involving deer at hazard hot-spots.
Other	The system aims to change the behaviour of car-drivers, not deer. Drivers are alerted to an acute, rather than a potential, hazard.
Time of realisation for measure	Immediate: Impact starts as soon as the system comes into operation.
Impact scope	Very localised (plot): This measure has a very localised impact on both sides of a section of road to a distance of around 300 m. If integrated into regionally significant wildlife corridors, however, it can also have impacts beyond the immediate locality.

Implementation

Implementation period	Days: The system can be installed quickly once a decision has been taken on where it should be located (in consultation with hunters).
Frequency	Recurring: Long-term measures, to be adapted as required.

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): Costs of this type of system amount to approx. € 60,000-100,000. More compact and flexible solutions are also available (e.g. mobile systems).
Socio-economic impacts	Medium: Prevents damage to vehicles, physical injury to individuals and loss of game animals.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	Voluntary cooperation among stakeholders.

Further information

Evaluation	A pilot project involving Calstrom-type warning systems carried out from 1995-1997 in Switzerland had very positive effects.
Information	Switzerland: Wildtier Schweiz http://www.wild.uzh.ch/
Contact	Switzerland: Expert: Roman Kistler, Fishing and Hunting Administration of Thurgau Canton (CH) Expert: Paul Marchesi, DROSERA - écologie appliquée SA, Sion (CH)

Green bridges/ wildlife crossings

Wildlife crossings should be located at known animal crossing points or specific “conflict points” in the transregional transport network. © Sina Hölscher

Involved sectors

Forestry, Hunting, Spatial planning, Nature protection, Transport, Other: NGO, Districts

Affected habitats

Areas for settlements and transport

Description

A wildlife crossing, or green bridge, is intended to serve as an aid to wild animals, enabling them to cross busy transport routes such as motorways, highways and even railway lines safely and thus mitigating the impacts of increasing landscape fragmentation. The position of these crossings is particularly important: wildlife crossings should be located at known animal crossing points or specific “conflict points” in the transregional transport network. In order to screen the view of the transport routes to be crossed, the edges of the bridge are often planted with hedgerows, with much of the rest of the surface of the bridge being covered in vegetation as well. There are now numerous studies which provide information about required dimensions, vegetation, technical construction details etc.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Green bridges are a suitable method of mitigating the fragmentation effects of roads, connecting habitats across roads and safeguarding regional and transregional migration routes.
Improvement or preservation of habitats	The bridges are particularly effective if they do not appear to be foreign bodies or separate biotopes but are designed as habitats and thus meet the habitat requirements of smaller vertebrate or invertebrate species as well.

Element of ecological network	If integrated into a biotope networking strategy, the crossing aids become important sections of corridors.
Other	From a nature conservation perspective, key aspects such as fragmentation of species' partial habitats, impediments to large-scale annual migrations, impediments to the (re-) dispersion of animal species and thus the new colonisation or recolonisation of habitats by species which had previously been eliminated or had died out should also be taken into consideration during planning.
Time of realisation for measure	Months: Once built, the bridge can be used immediately. Guide structures leading to it facilitate animals' acceptance.
Impact scope	Local (municipality): Depending on the species and the importance of the crossing point, the impact can range from local to transregional.
Implementation	
Implementation period	Months: Planning and construction of these crossing aids are very costly and time-consuming.
Frequency	Non-recurring: Should be accompanied by monitoring of effectiveness.
Economic and legal aspects	
Costs	Very high (>1 Mio. EUR): Building costs of a green bridge amount to € 1-5 million. Ongoing maintenance costs must also be considered.
Socio-economic impacts	Low: Reduction in number of accidents involving deer (physical damage, loss of game, personal injury ...)
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	Legal provisions exist indirectly via the European and national level relating to the spatial linkage of protected areas.
Further information	
Evaluation	Studies on the biological effectiveness of green bridges have shown that they make a major contribution to habitat connectivity. They are not only used by large animals but also by invertebrates such as butterflies, spiders and beetles. Green bridges do not only have a connecting function, they also help to reduce the number of accidents involving deer.

Information	Austria: Detailed recommendations in core study: VÖLK, F.; GLITZNER, I. & WÖSS, M. (2001): Kostenreduktion bei Grünbrücken durch deren rationellen Einsatz. Kriterien – Indikatoren – Mindeststandards. Straßenforschung, Heft 513. Bundesministerium für Verkehr, Innovation und Technologie, Wien. » http://www.fsv.at/
Contact	Austria: A wealth of key information, literature, links and case studies is available from Austrian Federal Environment Agency (http://www.umweltbundesamt.at/)

Use of indigenous seeds and plants

Meadow from the Swabian mountains, which is cut twice a year. © Dr. Gottfried Briemle, Aulendorf

Involved sectors

Agriculture, Water management, Spatial planning, Nature protection, Transport

Affected habitats

Areas for settlements and transport

Description

During renaturation measures and other construction projects (construction of roads, railways and watercourses, and landscaping), but also in gardens and city parks, it is important not only to select site-appropriate species but also to use indigenous seeds and plants of local origin. The use of non-local seed may result in locally specific adaptations and regional biotopes being squeezed out or impaired, which may have a negative impact on other organisms, such as nectar-collecting and pollinating insects. Furthermore, some individual species may behave in an invasive manner. The use of indigenous seeds also helps to safeguard biotope-specific species diversity and promote native wild plants, thus contributing to the biotope network and the preservation of genetic diversity in line with the Convention on Biological Diversity (CBD).

Impact

Impact in particular on	Insects

Ecological impact

Improvement or preservation of habitats	Some insect species depend on native species of plant. By using specific species and with appropriate management, the habitat is enhanced, especially on spaces along transport routes.
Element of ecological network	Species-rich areas along transport routes can act as stepping stone biotopes in the biotope network. Indigenous species are particularly valuable.
Other	Preservation of genetic diversity (Convention on Biological Diversity).
Time of realisation for measure	Months: Some months will elapse from the time of the preparatory measures to the development of the full impact during the vegetation period.
Impact scope	Local (municipality): The use of indigenous seeds should be promoted transregionally in order to increase the impact of individual measures.

Implementation

Implementation period	Days: Can be well-integrated into conventional landscaping measures. In "greening" measures, appropriate seeds must be used.
Frequency	Recurring: This requires the implementation of a long-term strategy.

Economic and legal aspects

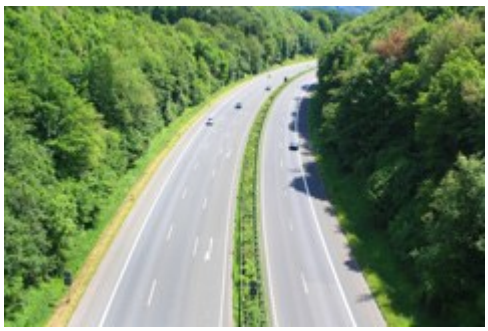
Costs	Very low (less than 1'000 EUR): The use of indigenous seeds and plants may result in higher costs in some cases.

Socio-economic impacts	Low: Seed production of indigenous wild species can offer alternative income generation opportunities for farmers in the region (domestic value-added instead of seed imports).
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	According to the Nature Conservation Act, the use of alien plants may be prohibited, so the use of indigenous plants and seed should be appropriately regulated by the relevant nature conservation authorities.

Further information

Evaluation	In Bavaria, technical recommendations have been developed on the use of indigenous plants and seeds, which should serve as guidelines for nature conservation authorities. As EU rules on the marketing of seeds and seed mixtures exist, amendment of national legislation may be required.
Information	Germany: Further information at: http://www.stmug.bayern.de/umwelt/-naturschutz/autochthon/index.htm

Site-appropriate “greening” in road and watercourse construction and landscaping



When creating green areas during the construction of roads one has to regard the fitting seed assortme
Rike/ pixelio.de

Involved sectors

Agriculture, Water management, Spatial planning, Transport

Affected habitats

Areas for settlements and transport

Description

When creating green areas during the construction of roads, railways and watercourses and landscaping pr seed assortments are often used which, due to their species poverty, are not suitable for ecologically va "greening" or are not site-appropriate and therefore result in biologically impoverished landscape areas. The is a large number of seriously eroded sites at higher altitudes, vegetation-free embankments, and river which are far from being in a natural state. If, on the other hand, site-appropriate seed mixtures are use adapted species which are suitable for elevated sites, for example, the green spaces can become va elements of a biotope network.

Impact

Impact in particular on	Small mammals, Birds, Insects
Ecological impact	
Improvement or preservation of habitats	Embankments which are designed to be as near-natural as possible and spaces adja infrastructure can provide habitats for rare species.
Element of ecological network	These spaces can form stepping stones in the biotope network. The impact can be inc through integration into a broader strategy.
Other	Spaces with near-natural growth contribute to soil protection and guard against erosion.
Time of realisation for measure	Months: Some months elapse from the time the preparatory measures are carried out u full impact occurs during the vegetation period.
Impact scope	Local (municipality): If linked with broader biotope network planning (e.g. linkage with areas with scrub, extensive grassland, hedges, oligotrophic grasslands, edges), the im increased.

Implementation

Implementation period	Days: "Greening" measures do not take much time and can be well-integrated into conve landscaping schemes.
Frequency	Recurring: This requires the implementation of a long-term strategy.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): The additional costs which may be associated with the m can be set against improved economic viability as there is no longer any need to bring in costs of remediation are also reduced, and less maintenance is involved.
Socio-economic impacts	Low: Production of seed of site-appropriate species can offer alternative income gen opportunities for farmers in the region (domestic value-added instead of seed imports).
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	In Upper Austria, framework guidelines have been developed for the performance, ecc supervision and approval of site-appropriate "greening" schemes.

Further information

Evaluation	The Austrian Grassland Federation (ÖAG) has developed guidelines on site-appropriate gr which can provide guidance. Various seed mixtures have also been developed ("natural m seed" project).
Information	Austria: Further information on seed mixtures: http://www.wildblumensaatgut.at/Resources/Regelwerk.pdf , http://www.saatbau.at/deutsch/saatgut/renatura/produktvorstellung/begruenungsmischunge
Contact	Austria: Working Group on Site-Appropriate Greening: Head - Dr. Bernhard Krautzer

Roadverge management to encourage species diversity

Green strips along roadsides. © Rainer Sturm / pixelio.de

Involved sectors

Nature protection, Transport

Affected habitats

Areas for settlements and transport

Description

Delaying mowing gives plants the opportunity to bloom and form fruits and seeds. In this way, they can provide food and cover for insects and other small animals. The habitat quality of green strips and roadside verges depends on various factors, and mowing is one of the factors which are easiest to influence. By delaying mowing of verges until late summer, or by using mosaic-type mowing techniques, which involves mowing only a small area at a time, habitat conditions can be improved, e.g. for butterflies and various other species.

Impact

Impact in particular on	Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	As these are roadside verges, they form a network of green spaces which can facilitate migration of plants and animals and, if structured in an environmentally compatible way, can help to mitigate fragmentation.
Improvement or preservation of habitats	Delaying mowing gives plants the opportunity to bloom and form fruits and seeds and thus provide habitats for more fauna, especially insects.
Element of ecological network	If the managed spaces are integrated into a broader biotope networking strategy, they can act as corridors along roads between core areas. However, it is important to consider the potential risk of neophyte encroachment.

Time of realisation for measure	Months: The impact develops mainly during the vegetation period.
Impact scope	Very localised (plot): The measure mainly benefits insects and plants and so its impact is mainly local.
Implementation	
Implementation period	Months: Ideally, this measure should be implemented at municipal or even at regional level so that it can develop its full impact, especially in terms of ecoconnectivity.
Frequency	Recurring: Ideally, mowing should be managed over a number of years.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): No additional costs arise as a result of the measure compared with conventional mowing management.
Socio-economic impacts	Medium: Better planning of working time and use of resources and a reduced workload can all help to cut costs.
Sources of financing	Public: local, Public: regional, Public: national
Legal situation	Traffic safety prescribed by law must be adhered to.
Further information	
Evaluation	In the Département Isère, the highways department and the administration of the Département (Conseil Général), in partnership with the nature conservation organisation GENTIANA, have been running a project since 2004 entitled “Managed mowing of roadside verges: protecting nature”, which focusses on the roadside verges and green strips in the road network. Signs at strategically and ecologically important sections of the highway network draw attention to the scheme and inform the public. The project’s positive impacts on flora and fauna have already been demonstrated.
Information	Other: Information on "managed mowing", together with checklists and examples, are available on the GENTIANA website: http://www.gentiana.org/
Contact	Other: Contact person for these projects at Gentiana: Pierre Salen
Good Practice	Managed mowing of roadside verges, Isère, France Gestion raisonnable du fauchage des bords des routes Gestione ottimizzata degli sfalci ai margini delle carreggiate

Water resources management

Revitalisation of flowing waters

Flowing water systems form important corridors for the migration and dispersion of flora and fauna. © Olga Meier-Sander/ pixelio.de

Involved sectors

Water management, Fishery, Spatial planning, Tourism and leisure, Nature protection

Affected habitats

Waterbodies

Description

Flowing water systems, from source to mouth, form linear connecting elements and, together with their associated ecosystems (riparian forests, woodland), form important corridors for the migration and dispersion of flora and fauna. Very often, the space and dynamics left to most of the rivers in the Alpine region are severely limited. At the same time, flowing waters are highly conducive to cross-border cooperation as they generally flow through several countries and often form natural boundaries which may also constitute national borders. To improve flowing water functions, a range of measures can be adopted to return flowing waters to a natural unimpeded state, at least in part, thus enabling them to develop in a near-natural manner (restoration or revitalisation measures). Possible measures range from the introduction of deadwood to comprehensive rehabilitation measures and expansion.

Impact

Impact in particular on Reptiles, Amphibians, Birds, Fish

Ecological impact

Other	The restoration of the continuity of watercourses is an integral element of the EU Water Framework Directive (WFD) and therefore a mandatory task in terms of water resources management. Flood protection.

Time of realisation for measure	Years: The scope of impact achieved depends on the type and scope of the measures and the state of the section of the watercourse at the outset.
Impact scope	Regional: The flowing waters contained in the catchment area, adjacent biotopes and the entire flood plain must be included.
Implementation	
Implementation period	Long term: Dependent on the type and scope of the measures and the state of the section of the watercourse at the outset.
Frequency	Non-recurring: Should be accompanied by monitoring of effectiveness.
Economic and legal aspects	
Costs	Very high (>1 Mio. EUR): The costs depend on the type and scope of the measures to be implemented and range from around €2000 up to > €150,000 per 100 m of watercourse.
Socio-economic impacts	Medium: Revitalisation measures, by means of effective flood protection, can have positive economic effects despite the high costs.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	River restoration and revitalisation measures are part of landscape planning, but can, on a smaller scale, also be carried out by voluntary nature conservation.
Further information	
Evaluation	Numerous river revitalisation measures have already been carried out successfully, and the importance of intact and natural river systems has been proven by several studies. Near-natural flowing waters are also of relevance to tourism and flood protection and are helping to implement the EU Water Framework Directive.
Information	Other: Projects from various initiatives have been implemented: e.g. Wild River Landscape of the Tyrolean Lech, Lifeline Upper Drava, rehabilitation of the lower Salzach, Donau-Auen national park, RECORD at the Swiss Federal Institute of Technology.
Contact	Other: http://www.tiroler-lech.at, http://www.life-drau.at, http://www.sanierung-salzach.info, http://www.swiss-experiment.ch/images/6/6f/RECORD_Beschreibung_deutsch.pdf, http://www.donauauen.at

Good Practice	LIFE Project: Wild River Landscape of the Tyrolean Lech, Austria Projet LIFE – Paysage de rivière torrentielle du Lech, Tyrol, Autriche Progetto LIFE Paesaggio torrentizio Tiroler Lech, Austria

Management and maintenance of flowing waters

An individual management plan should be produced for each body of water. © Carolin Begle/ CIPRA International

Involved sectors

Agriculture, Water management, Fishery, Nature protection

Affected habitats

Waterbodies

Description

Near-natural flowing water systems are important connecting elements which make a substantial contribution to reducing fragmentation. In many cases, however, the space and financial resources required for the comprehensive revitalisation of obstructed rivers are not available. However, upgrading can be achieved with near-natural, differentiated management concepts which can be integrated into the legally prescribed management work along water bodies (flood protection). As part of this process, a holistic view should be taken of the embankments, riparian zones and water bodies, and adjacent green spaces (biotope network) should also be included. Appropriate maintenance measures include management of meadows, woodland (bank stabilisation), and regeneration in the areas of erosion. An individual management plan should be produced for each body of water, clearly defining the development goals.

Impact	
Impact in particular on	Reptiles, Amphibians, Birds, Fish
Ecological impact	
Reduction of fragmentation or creation of new valuable habitats	Richly structured near-natural flowing waters are important landscape elements with a high connectivity potential.
Improvement or preservation of habitats	Appropriate maintenance measures improve the habitat quality of various species of flora and fauna, diverse structures are created and the dynamics of the watercourses increase.
Element of ecological network	Near-natural flowing water systems with a high degree of structural diversity form valuable elements of a biotope network and provide corridors for the migration and dispersion of flora and fauna.
Other	The increase in natural habitats by flowing waters, achieved through revitalisation measures, promotes the attainment of 'good ecological status' for the bodies of water as defined in the EU Water Framework Directive.
Time of realisation for measure	Immediate: The impact either becomes apparent immediately or only appears after a few years, depending on the measure.
Impact scope	Regional: Watercourse management measures are carried out locally but can be of importance at regional level.
Implementation	
Implementation period	Days: Maintenance measures should be planned in advance and take place in partial interventions throughout the whole year, however only in riparian zone sections that are actually in need of maintenance.
Frequency	Recurring: Should be regular.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): The costs are dependent on the type and scope of the measures to be implemented and, depending on the measure, can be financed through countryside management programmes.
Socio-economic impacts	Medium: Flood protection measures can have positive economic effects.

Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Maintenance measures on bodies of water can form part of flood protection measures but, on a smaller scale, can be implemented by voluntary nature conservation or the local population.

Further information

Evaluation	Watercourse management measures are being implemented everywhere and form part of flood protection measures. In addition, an example of an initiative to involve local municipalities and organisations exists in Switzerland in the form of an action day to maintain and upgrade water bodies. Maintenance and management measures on flowing waters are also implemented by nature conservation organisations.
Information	Other: From the relevant water management authorities and voluntary nature conservation organisations.
Contact	Switzerland: e.g. http://wasser.umweltschutz.ch/download/merkblatt_g3.pdf or http://wasser.umweltschutz.ch/download/leitfaden_aktionstag_03.pdf

Establishment of riverside margins with site-specific/typical riparian vegetation

Riparian strips, at least 3-5 m wide, along flowing waters act as buffers and form linear connecting elements © Yann Kohler

Involved sectors

Agriculture, Fishery, Spatial planning, Nature protection

Affected habitats

Waterbodies

Description

Riparian strips, as the transition between water surfaces and land, are of particular ecological significance for water quality and are an important connecting element in the biotope network. These riparian strips play a key role in intensively used landscapes in terms of maintaining water functions (filter/buffer functions, protection of embankments, prevention of erosion). The restoration, or the development and maintenance, of existing riparian strips is thus a key priority in the active protection of the aquatic environment. The riparian zone also creates habitats, provides food and serves as a protective and resting space, and also provides nesting and breeding places. Riparian strips should therefore be equipped with site-appropriate near-natural vegetation and typical tree species, and, depending on the body of water, be at least 5-15 m wide.

Impact

Impact in particular on Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Richly structured near-natural flowing waters are important landscape elements with a high connectivity potential.
Improvement or preservation of habitats	The habitat quality for various species of flora and fauna is improved and diverse structures are created along the watercourse.

Element of ecological network	Near-natural flowing water systems form valuable elements of a biotope network and provide important corridors for the migration and dispersion of flora and fauna.
Other	Typical tree species for the area can help protect against floods. The increase in natural habitats by flowing waters also helps to increase the quality of the water, and thus to achieve a 'good ecological status' for the body of water as defined in the EU Water Framework Directive.
Time of realisation for measure	Months: Riparian strips created in a near-natural way develop their positive impacts after a few months (first vegetation period).
Impact scope	Very localised (plot), Local (municipality): Comments: Comprehensive planning increases the degree of impact. Ideally, in addition to the riparian zones, structures typical for river meadows such as backwaters, wetlands and meanders should be included.
Implementation	
Implementation period	Weeks, Months: Depending on the condition at the outset, the planning process takes a long period of time; in most cases individual measures can be implemented within a short period of time.
Frequency	Recurring: While planting is a single operation, it has to be followed by regular maintenance.
Economic and legal aspects	
Costs	High (100'000-1 Mio EUR): Renunciation of use in the case of extensive use of riparian strips, compensation payments by countryside management programmes of between €289/ha per year and €715/ha per year.
Socio-economic impacts	No direct impact: Expenditure can be reduced through the development of watercourses through their own dynamics. The appearance of the landscape is enhanced.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Funding opportunities	Austria: Information will be available soon.
Legal situation	In most cases, statutory regulations govern the establishment of riparian strips (around 10 m), but their design is not established precisely. Some standards can be drawn from the EU Water Framework Directive (WFD).
Further information	

Evaluation	The positive impact of riparian strips and, due to their linear structure, their substantial importance for the biotope network, have already been recognised. To date there have only been a few examples in which riparian strips and woodland have been specifically included in the planning of biotope networks.
Information	Other: Further information on the relevant terms and conditions governing support for riparian strips and woodland can be obtained from the nature conservation authorities concerned, the countryside management programmes and the water resources management authorities.

Maintenance of alluvial forests

Riparian forests are the natural type of vegetation along streams and rivers. © Ich-und-Du/ pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Nature protection

Affected habitats

Forest, Waterbodies

Description

Riparian forests are the natural type of vegetation along streams and rivers, and are strongly influenced by flooding and high groundwater levels. Due to their small-scale mosaic of different site conditions, riparian forests count among Europe's most species-rich habitats. Due to their preference for river meadows as their habitat, near-natural riparian forests have virtually disappeared from Central Europe, however, as many riparian forests have been cleared and transformed into pasturage. Riparian forests have high recreational value, store water and improve groundwater quality. Depending on their size and condition, they can also contribute to flood protection. As ecosystems associated with flowing waters, they are extremely important for ecological connectivity. Measures to maintain and develop the riparian forests may include, for example, planting of typical tree species, near-natural management, securing of existing areas and maintaining structures associated with the riparian forests (e.g. small water bodies).

Impact

Impact in particular on	Small mammals, Reptiles, Amphibians, Birds
Ecological impact	
Improvement or preservation of habitats	Riparian forests constitute valuable habitats for many rare species, including white dryas (Dryas octopetala), the European tree-frog (Hyla arborea), the natterjack toad (Bufo calamita) and the Lady's Slipper.
Element of ecological network	Near-natural flowing water systems with their associated structures constitute valuable elements of a biotope network. They provide corridors for the migration and dispersion of many flora and fauna.
Other	Intact riparian forests help to improve surface water, stabilise the hydrological regime (EU-WFD) and protect against floods.
Time of realisation for measure	Months: Depending on the situation at the outset and the measures required, the impact is either immediate, is revealed after some months or only appears over the long term.
Impact scope	Local (municipality): To increase the impact, other accompanying structures should also be included in an appropriate strategy (such as, inter alia, standing water bodies, humid forests, headwaters).

Implementation

Implementation period	Months: The duration of the measures depends, in particular, on the situation at the outset. Comprehensive planning is required In the case of large-scale strategies that take account of the numerous interactions between the river meadows and the flowing waters.

Frequency	Non-recurring: Regular support measures to help create a typical structure, in accordance with the local situation.

Economic and legal aspects

Costs	Low (1'000-10'000 EUR): Costs vary greatly depending on the measure. In most cases, conservation does not require comprehensive maintenance measures; renunciations of use can incur costs.
Socio-economic impacts	Low: Subsidies for the protection of the aquatic environment and for flood protection (e.g. cultural landscape programme) are possible.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Legal situation	Conflicts of objectives regarding other functions may occur. Riparian forests in Europe have a special protected status, inter alia, through the Habitats Directive.

Further information

Evaluation	The significant importance, in nature conservation terms, of riparian forests is demonstrated, inter alia, by their high protected status. Information on suitable measures and subsidies can be obtained from the nature conservation authority concerned.
Information	Other: From the relevant nature conservation authorities and organisations. Further information also available under: www.waldwissen.net

Creation of fish passes and other fish migration aids

Numerous versions of fish migration aids exist. In the picture: fish pass. © Umweltbundesamt

Involved sectors

Water management, Fishery, Nature protection, Other: Energy

Affected habitats

Waterbodies

Description

Obstructions such as river bottom steps, weirs, retention basins etc. can be found along many Alpine streams and rivers. These constitute insurmountable obstacles to the migration of fish and other organisms in flowing waters. Fish migration aids (also known as fish ladders or fish passes) are installed in flowing waters in order to give fish, in particular, the opportunity to overcome these artificial obstacles. There are numerous versions of these aids (river bottom slides, fish ramps, fish passes, bypass flume(s) …), which can be deployed to suit the target species, the obstacle to be overcome, and local conditions.

Impact

Impact in particular on Insects, Fish

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Weirs and other installations in streams constitute insurmountable obstacles to almost all organisms living in water, and divide streams into many small sections. Fish passes provide a connection between the sections.
Element of ecological network	Should acidification or water pollution cause a species of fish to die out in one section, an isolated section cannot be repopulated. Fish ladders take over the role of corridors here.

Other	The migration aids can lessen the impact of the changed ecological conditions (silt and sludge deposits, higher temperatures, lower oxygen concentrations) caused by the alternation between fast-flowing areas to practically stagnant stretches of water at weirs and similar installations.
Time of realisation for measure	Immediate: The migration aids can be used by fish and other living organisms in flowing waters as soon as they have been installed.
Impact scope	Local (municipality): The impact is primarily of importance in the flowing waters in question and, in this case, in the affected section in particular. However, in larger bodies of water or on major fish migration routes, the measure can gain regional importance.
Implementation	
Implementation period	**Weeks: Many of the migration aids addressed are complex structures which, on top of the planning process, also take some time to build.**
Frequency	**Non-recurring: Should be accompanied by monitoring of effectiveness.**
Economic and legal aspects	
Costs	**High (100'000-1 Mio EUR): Fish migration aids are very expensive installations. Depending on the structure, the costs can range from 100,000 to several millions of euros.**
Socio-economic impacts	**Low: Increased fish stocks, improved water quality in the flowing waters.**
Sources of financing	**Private sponsor, Other private sources, Public: local, Public: regional, Public: national, Public: European**
Legal situation	**The need for fish migration aids is regulated by law throughout Europe by, inter alia, the EU Water Framework Directive.**
Further information	
Evaluation	The technical know-how for the construction of fish migration aids has improved significantly and the new opportunities and variants enable suitable solutions to be proposed for every obstacle or situation. The ecological importance and impact of the migration aids have been shown in numerous scientific studies.
Information	Other: e.g.: Salzburger Fischpass-Fibel: Erfahrungen zu Bau und Betrieb von Fischaufstiegshilfen (2002). Land Salzburg, Abt. Naturschutz, Referat Gewässerschutz. 152 S.

Public relations work and sensitisation

Sports competitions

Sports competitions can help raise public awareness of biotope networks. © rheinerftkreis/ flickr.com

Involved sectors

Agriculture, Forestry, Hunting, Tourism and leisure, Nature protection, Local population/citizens, Public relations and environmental education, Other: Sports Associations

Affected habitats

Measure independent of habitat

Description

Sports competitions can help raise public awareness of biotope networks. In particular, the importance of wildlife corridors can be conveyed very effectively through the selection of a high-profile species of fauna. Organising races at local level (e.g. wildcat runs in Thuringia, Bavaria and Hesse) can encourage hikers, walkers and runners and draw attention to the need to network habitats of specific species. Besides the sports competition, information can be provided, e.g. through an appropriate flanking programme and exhibitions which raise awareness of how the animals live and the obstacles to their migration. Additional funds (e.g. for the purchase of areas to create a biotope network) can also be sought in this way. This raises awareness of rare species of fauna and sensitises the public to the issue of landscape fragmentation.

Impact

Impact in particular on	Big mammals
Ecological impact	
Other	A direct ecological impact can only be achieved through embedding in an overall concept, e.g. through donations at the event for the purchase or exchange of areas.

Time of realisation for measure	Immediate: Public awareness is raised immediately, but direct ecological impacts only arise after some years with adoption of more comprehensive measures (see above).
Impact scope	Transregional: Events can be organised at various levels, but individual events should be embedded in a transregional concept.
Implementation	
Implementation period	Months: Organising an event is very time-consuming if it is to appeal to the general public and generate effective publicity.
Frequency	Non-recurring, Recurring: Can be a single, annual action.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Depending on the size of the event and accompanying actions, at least € 2000 will be required.
Socio-economic impacts	No direct impact: By increasing public awareness, positive impacts (donations, volunteers) can be expected. The events may also be of interest to the tourism sector.
Sources of financing	Private sponsor, Public: local, Public: regional, Public: national
Further information	
Evaluation	The "Running Wild" - “race for life” for the European wildcat (Felis silvestris silvestris) has already taken place three times (2006, twice in 2008) at the initiative of BUND Deutschland (Friends of the Earth Germany) to publicise the planned migration corridor for wildcats between Hainich National Park and the Thuringian Forest (Thüringer Wald) (Hesse, Bavaria, Thuringia in Germany).
Information	Other: Further information about the "race for life" for the European wildcat is available at: http://wildkatzet3.bund.net/index.php?id=79
Good Practice	“Running Wild” – the wildcat run, Germany Exemple « Running Wild – Courir pour le chat sauvage » Esempio “Running Wild – Corsa per il gatto selvatico“

Information campaigns in towns and municipalities

Settlements contribute to the fragmentation of the landscape. © Zeitenspiegel/ Frank Schultze

Involved sectors

Nature protection, Local population/citizens, Municipalities

Affected habitats

Measure independent of habitat

Description

Settlements are among those areas which may contribute to the fragmentation of the landscape and whose development may contribute to habitat decline. However, it may be possible to mitigate these effects with measures adopted in the gardens and green spaces of towns and villages. The permeability of the areas and, above all, of the spatial restrictions can be increased, habitats can be created or made more environmentally compatible, and the use of pesticides and herbicides can be dispensed with, etc. By means of information campaigns and brochures sent out along with building permits, for example, the public can be encouraged to adopt these measures. Possible measures include: creation of near-natural hedges from local timber, permeability of fencing around properties, “insect hotels”, bee forage etc.

Impact

Impact in particular on	Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Simple methods such as small recesses in walls, wider meshes in fences, etc. can greatly increase the mobility of insects, small mammals, amphibians, etc. in residential areas.
Improvement or preservation of habitats	Insect hotels, near-natural hedges, nesting boxes, dead branches and piles of leaves, stones and "wild corners" in gardens increase the diversity, quality and supply of habitats in settlements.

Element of ecological network	Appropriately designed and managed parks and gardens can form significant stepping stone biotopes.
Other	More nature in settlements has positive effects on the hydrological regime, climate and human health.
Time of realisation for measure	Years: Depending on the measure, the impact may commence immediately (e.g. creation of an opening in a boundary wall) or only after several years (creation of hedges, tree-planting, restoration of water bodies).
Impact scope	Local (municipality): In order to achieve a good impact, it is important to work at community level and involve as many local residents as possible!
Implementation	
Implementation period	Long term: Most of the measures listed can be implemented relatively quickly and with little expense or work.
Frequency	Non-recurring, Recurring: Long-term awareness building is needed for optimal effect. Individual measures can be implemented with limited resources.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Most of the examples listed are not very cost-intensive. The work can be carried out as part of local projects, often with volunteers.
Socio-economic impacts	Low: More attractive living environment, more "nature" in settlements.
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional
Legal situation	Implementation of the measures takes place on a voluntary basis.
Further information	
Evaluation	Experience has shown that citizens are often unaware or have little information about these issues and respond very positively to ideas and suggestions. If the municipalities contribute to the costs of a new near-natural hedge, for example, a great many volunteers can be recruited very quickly.
Information	France: Departement Isère has published numerous brochures on this theme and runs regular information campaigns: http://www.isere-environnement.fr/pages/index/id/6416/
Contact	France: Conseil général de l'Isère (http://www.cg38.fr/)

Guided tours and information events

Local information events and guided tours are important measures. © WWF/ L.Umek

Involved sectors

Agriculture, Spatial planning, Nature protection, Municipalities

Affected habitats

Measure independent of habitat

Description

In the implementation of measures and thus the realisation of biotope network projects at local level, spatial and landscape planners and municipal administrations have a role to play as key actors alongside the nature conservation organisations, which are often the driving forces behind biotope network projects. Local information events and guided tours are a good way of informing these actors (as well as other stakeholders such as farmers, hunters etc.) about the issue of biotope networks and ecological connectivity and ways of realising them in practice. What is important, to ensure the success of these initiatives, is to prepare summary documentation (e.g. a manual with decision-making aids) and to present the benefits and value-added which such projects can generate at local level (multifunctionality of corridors which are significant not only in ecological terms but also perform key social functions as spaces for leisure and recreation as well as economic functions, e.g. through the sustainable management of roadside grass verges).

Impact

Ecological impact

Other	Indirect through training and sensitisation of decison-makers and local stakeholders.
Time of realisation for measure	Immediate: Participants must be motivated to take account of connectivity issues in their decisions, ideally starting straight away. Results can be expected in the long term.
Impact scope	Local (municipality): Depends on audience. Cooperation between municipalities at regional level should be proposed.

Implementation

Implementation period	Weeks: Training and guided tours take some time to prepare, but delivery can take place in a standardised format.
Frequency	Recurring: Long-term awareness building is needed for optimal effect.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Cost are incurred due to the working time taken in preparing and delivering training and preparing information material.
Socio-economic impacts	Low: Sensitisation of the public.
Sources of financing	Other private sources, Public: local, Public: regional
Legal situation	Voluntary information events.

Further information

Evaluation	This measure cannot be expected to produce direct ecological impacts. However, the good cooperation and extremely high level of interest shown at the well-attended daytime and evening events for decision-makers in the municipalities and administrations, such as those held by nature conservation association FRAPNA, demonstrate the high level of interest in these measures and are thus likely to have an indirect positive ecological impact.
Information	Other: Experience already gained in some pilot regions in the Alps (Engadine, Gesäuse, Isère).
Contact	France: e.g. Arnaud Callec, Conseil général de l'Isère

Coordination of cultivation competition

A particular commitment to nature and species conservation and the preservation of cultural landscapes can be rewarded through competitions. © Hermann/ pixelio.de

Involved sectors

Agriculture, Forestry, Tourism and leisure, Nature protection, Local population/citizens, Public relations and environmental education

Affected habitats

Forest, Bogs and fens, wetlands, Grassland, Arable land

Description

A particular commitment to nature and species conservation and the preservation of valuable regional cultural landscapes, also within the framework of biotope network initiatives, can be rewarded through competitions. At the same time, the public can be informed about farmers' commitment, thus increasing the acceptance of biotope networking measures. In this way, the services provided by agriculture for the preservation of the cultural landscape or networks of interlinked biotopes can be rewarded, while raising awareness of measures adopted within the framework of regional cultural landscape programmes. For farmers, the provision of public information and the ensuing recognition of their work create incentives to manage their areas in a manner conducive to biotope connectivity.

Impact

Ecological impact

Improvement or preservation of habitats	Competitions can offer incentives for habitat improvement, thus creating habitats for rare species of animal and plant (e.g. extensive grassland).
Element of ecological network	Appropriate competition design facilitates a focus on aspects of ecological connectivity.
Other	Overall concepts (e.g. for a local biotope network) can be planned and implemented as part of a competition.

Time of realisation for measure	Months: The impact depends on the focus of the competition but manageable time frames should be aimed for.
Impact scope	Local (municipality): The impact can be enhanced with comprehensive planning and embedding in an overall concept.
Implementation	
Implementation period	Weeks: Competitions can be implemented within very short periods of time.
Frequency	Non-recurring, Recurring: Can be a single or annual action.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Costs are associated with the prizes awarded, the inspection of sites, PR work, and organisation. Depending on size, at least € 2000 will be required.
Socio-economic impacts	Low: If marketed appropriately, competitions can serve to attract tourists.
Sources of financing	Private sponsor, Public: local, Public: regional
Further information	
Evaluation	In the Eifel, Germany, a meadow management competition took place in 2007 in which dry, fertilised and wet meadows were scored according to nature conservation criteria, management method, status from an agricultural perspective, and the farmer's publicity work.
Information	Germany: e.g. http://www.wiesenmeisterschaft-eifel.de

Educational pathways

Increase knowledge while offering an experience of nature. © froutes/ flickr.com

Involved sectors

Tourism and leisure, Nature protection, Public relations and environmental education, Other: Schools

Affected habitats

Measure independent of habitat

Description

The purpose of an educational pathway is to impart and increase knowledge while offering an experience of nature, recreation and raising environmental awareness. Pathways also offer a good opportunity to bring the issue of biotope networks closer to the public and thus publicise a local or regional project. The “Green Light for Ecological Corridors” educational pathway, for example, was developed as part of a transnational Interreg III A project by three nature conservation organisations: Pro Natura Genève, Appollon 74 and FRAPNA Haute-Savoie. Along the pathway, there are numerous information boards which explain the significance of ecological corridors. The boards were designed in conjunction with school classes from the local area. As part of this collaboration, teachers and students explored the topic of habitat connectivity in great detail. 20 classes were involved in total. In addition, various other educational tools, such as a brochure and a touring exhibition, were developed as part of the project.

Impact

Ecological impact

Other	Indirect ecological impact via environmental education and public information.
Time of realisation for measure	Immediate: In view of the costs, an educational pathway should be long-term in focus. In this way, it can also demonstrate the effect of a variety of measures to promote connectivity.

Impact scope	Regional: Depending on the location of the educational pathway, it may also attract tourists and visitors from other areas.
Implementation	
Implementation period	Months: If properly thought out, the planning, development and implementation of an educational pathway can involve quite a considerable workload.
Frequency	Non-recurring: Requires permanent maintenance of info boards.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Depending on scope (length of educational pathway, terrain, use of existing pathways, number of stops) an educational pathway may entail costs running into several tens of thousands of euros.
Socio-economic impacts	Low: May attract visitors. Environmental education.
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional, Public: European
Further information	
Evaluation	This measure cannot be expected to produce direct ecological impacts. However, the good cooperation and extremely high level of interest on the part of the many school classes participating in the above-mentioned project demonstrate the effect of these measures and are thus likely to have an indirect positive ecological impact.
Information	Other: Brochure on the project and further details: http://www.pronatura.ch/ge/index.php?lang=3&mz=5 / http://www.frapna-haute-savoie.org/
Contact	France: Contact at FRAPNA Haute-Savoie: Damien Hiribarrondo
Good Practice	"Grünes Licht für ökologische Korridore" (Green Light for ecological corridors), French-Swiss border in the Geneva Basin area Exemple de la région frontalière franco-suisse du bassin lémanique Esempio del confine franco-svizzero del bacino del Lago di Lemano

Development and provision of educational materials on biotope networks and ecological connectivity

Children are the adults of tomorrow. © IRKA

Involved sectors

Nature protection, Public relations and environmental education, Other: Schools, Kindergarden

Affected habitats

Measure independent of habitat

Description

The description of this measure is based on the “Nature sans frontières” (Nature without Frontiers) games kit from the French nature conservation organisation FRAPNA. Children are the adults of tomorrow – and will be responsible for decision-making and action. For that reason, it is important to teach them about ecological relationships and the key functions of natural systems. This can be achieved simply and effectively through play. That is the aim of this educational games kit. It is a practical tool which enables children and young people to learn about the mobility needs of various sample species, recognise possible barriers and identify simple solutions to overcome them. The easily accessible games are ideally suited to the classroom and excursions into the local environment. The kit comprises a theoretical guide with explanations of the issues, suggested action and solutions (80 pages); an activity book with instructions for observations, 12 experiments and various activities (60 pages), and several games (card games, board games, identification sets etc.).

Impact

Ecological impact

Other	Indirectly through environmental education.
Time of realisation for measure	Immediate: Sensitising children to this issue is an important aspect of publicity work. As a rule, children are very receptive to the topic and are keen to take action immediately. To ensure a more lasting sensitisation impact, however, the issue must be addressed in detail over a longer period.

Impact scope	Local (municipality): The educational tool is being distributed throughout the region and presented to classes in schools.
Implementation	
Implementation period	Weeks: The longer the sensitisation period and the greater the detail, the more effective the message. This also allows specific activities and projects to be carried out with children, including in the field.
Frequency	Non-recurring
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Presentation of the games in the classes and facilitation are undertaken by volunteers. The games kit itself costs € 40.
Socio-economic impacts	Low
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional
Legal situation	Voluntary education offer.
Further information	
Evaluation	The kit is proving very popular with children and the experience reported by volunteers and staff from the nature conservation organisation is very positive. No data are available on the long-term impacts on the current and future behaviour of the children.
Information	Other: The games kit was developed in 2005-2008 as part of an environmental education campaign on ecological corridors: http://www.frapna-haute-savoie.org/
Contact	Other: http://www.frapna.org/
Good Practice	"Nature sans frontières" (Nature without Frontiers) games kit from the French nature conservation organisational FRAPNA Exemple de l'association française de défense de l'environnement FRAPNA : le kit de jeux « Nature sans frontières » L'esempio dell'Associazione ambientalista francese FRAPNA: Il kit di giochi "Natura senza frontiere"

Visitor information

Signage, information boards and waymarking can channel visitors in sensitive areas.
© Yann Kohler

Involved sectors

Agriculture, Forestry, Tourism and leisure, Nature protection, Local population/citizens, Public relations and environmental education

Affected habitats

Measure independent of habitat

Description

Information boards can be used to sensitise the public to the issue of biotope networks and inform them about relevant measures, e.g. in a nature conservation area. Visitors can also be channelled through a specific area by the information boards. In this way, usage can be shifted towards less sensitive areas, while efforts are made to preserve the tranquillity of, and reduce the burden on, areas in special need of protection and quiet zones. Information points are a good way of providing information and supporting active learning processes and “light-footprint” observation opportunities. Depending on the area, cultural and historical information can also form part of the pathway.

Impact

Ecological impact

Improvement or preservation of habitats	In combination with strategies to channel visitors, habitat improvements can be achieved (e.g. by creating a quieter environment in some areas).
Other	Information systems cannot be expected to produce direct ecological impacts, but in the long term, public awareness is increased and there is greater acceptance of the relevant measures.

Time of realisation for measure	**Immediate: Visitor information boards can start to have an impact as soon as they are in place. During the planning process, however, it is important to ensure that no additional disturbance will be caused.**
Impact scope	**Local (municipality): Educational pathways and information strategies can also be implemented on a larger scale. In general, however, they should only be considered for habitats which will not suffer any impairment as a result of the placement of information boards.**
Implementation	
Implementation period	Months: Planning and implementation of information strategies take time, depending on the size of the area.
Frequency	Non-recurring: Info boards require permanent care.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Costs can vary considerably depending on the materials used, scale and design. At least € 1000 in material costs must be assumed for each information board.
Socio-economic impacts	No direct impact: Attractive information offers may be beneficial to tourism.
Sources of financing	Other private sources, Public: local
Further information	
Evaluation	A wealth of information offers is available, which often also serve to channel visitors. In Switzerland, since 1996, near-natural areas and a networked system of natural habitats for flora and fauna have been developed in the Grosses Moos biotope network. In this context, an information strategy was developed with interactive elements, explaining the individual elements of the biotope network.
Information	Switzerland: Information programme in Grosses Moos (Switzerland): http://www.echanges.ch/exchange02/pdf/atelier_moos.pdf

Volunteer programmes

Some providers offer the opportunity to undertake voluntary work in the ecological sphere. © lia.la/ pixelio.de

Involved sectors

Agriculture, Forestry, Fishery, Tourism and leisure, Nature protection, Other: Private peolpe, NGO, Companies

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Some providers offer various target groups, e.g. families, companies, schools and private individuals, the opportunity to undertake voluntary work in the ecological sphere (e.g. in woodlands). Participants thus make an active contribution to forest, climate and species protection while gaining a very intensive experience of the ecosystem at the same time. The purpose of the volunteering is to improve habitat quality at specific project sites. Relevant programmes also inform the volunteers about connections within the various habitats and make a contribution to sensitisation and awareness-raising. Focussing measures on the creation of a biotope network is an option in this context. Cooperation through current "corporate social responsibility" initiatives also helps to raise environmental awareness and increase knowledge of the importance of connectivity measures in an up-to-date way while drawing attention to the problems arising in this context.

Impact

Ecological impact

Improvement or preservation of habitats	As a result of the volunteer work, and depending on the location and the measures undertaken, habitat quality can be improved.

Element of ecological network	By gearing projects towards ecological connectivity, activities focus on relevant elements.
Other	Volunteering raises awareness of nature conservation and, depending on the thematic focus, of the importance of connectivity measures.
Time of realisation for measure	Weeks: Depends on the specific measures being carried out. To increase participants' motivation, it is beneficial to achieve rapidly visible results.
Impact scope	Local (municipality): Assignments are carried out at local level. The impact increases with appropriate large-scale planning.
Implementation	
Implementation period	Weeks: Often, assignments last one week, but may only last for a few days. Several groups may contribute to the implementation of Individual measures.
Frequency	Non-recurring, Recurring: Single or repeated action, depending on type of measure.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Tools and vehicles must be available, as well as experts to explain and manage the projects; publicity work.
Socio-economic impacts	No direct impact: Relevant initiatives may also be attractive to tourists, and positive regional economic effects can be achieved.
Sources of financing	Private sponsor
Legal situation	Relevant organisations cooperate closely with forestry or nature conservation.
Further information	
Evaluation	The Bergwald Project has worked since 1987 to preserve the mountain forest with a main focus on Austria, Switzerland and Germany and, since 2006/7, Ukraine and Catalonia. WWF Switzerland also offers volunteering opportunities for companies with a focus on dry meadows in Lower Engadine (ECONNECT pilot region Inn-Etsch).
Information	Switzerland: http://www.bergwaldprojekt.ch http://www.bergwaldprojekt.de http://www.wwf.ch/de/tun/aktivwerden/freiwillig/umwelteinsatz/index.cfm

Landscape preservation days

Countryside management measures can involve joint action between various stakeholders and the local community. © Barbara Breyer/ Zeitenspiegel

Involved sectors

Agriculture, Forestry, Fishery, Hunting, Nature protection, Local population/citizens, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Countryside management measures can involve joint action between various stakeholders (nature conservation bodies, hunters, fishermen, farmers etc.) and the local community. Within the framework of these events, measures of relevance to ecological connectivity can also be implemented. They include, for example, maintaining richly structured, semi-open areas through the removal of wood, meadow management, or promotion of near-natural structures along watercourses. Activities can be undertaken at local or regional level at various intervals. The implementation of measures also increases the acceptance of the biotope network and raises public awareness at the same time.

Impact

Ecological impact

Improvement or preservation of habitats	As a result of the activities carried out as part of "countryside management days", and depending on the location and the measures undertaken, habitat quality can be improved.
Element of ecological network	By gearing projects towards ecological connectivity, activities focus on relevant elements.

Other	Acceptance in the local community is increased, perhaps leading to more measures to promote ecological connectivity.
Time of realisation for measure	Immediate: The impact depends on the measures carried out.
Impact scope	Very localised (plot): Implementation of the measures is generally localised.
Implementation	
Implementation period	Days: For smaller-scale activities, 1-day assignments are generally sufficient; several actions can also take place consecutively.
Frequency	Non-recurring, Recurring: Single or repeated action, depending on type of measure.
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): The requisite tools must be available,and it is customary to provide food for the helpers; costs can generally be kept low.
Socio-economic impacts	No direct impact: Important tasks can be undertaken, reducing the overall costs of biotope networking measures.
Sources of financing	Private sponsor, Public: local
Further information	
Evaluation	There are numerous initiatives, albeit without a specific focus on biotope connectivity so far. Often, nature conservation organisations initiate countryside management days and can provide further information.
Information	Other: Information about existing initiatives is available, for example, at: http://rohrhardsberg-life.de/artikel/landschaftspflege http://wasser.umweltschutz.ch/download/leitfaden_aktionstag_03.pdf

Monitoring by farmers

Farmers are important partners in the implementation of relevant measures. © Uwe Steinbrich/ pixelio.de

Involved sectors

Forestry, Nature protection

Affected habitats

Grassland, Arable land

Description

Farmers, with their areas distributed through the landscape, are key elements of transregional networks of interlinked biotopes and are therefore important partners in the implementation of relevant measures. They also possess extensive knowledge and many years of experience which they can contribute to the planning and implementation of biotope networking measures. It is therefore extremely important to involve farmers as stakeholders. They can also perform a key function by monitoring the development of endangered and/or rare species on their own farmland. This observation process raises awareness and also improves their understanding of the purpose of certain management requirements (e.g. areas of extensive use, set-aside etc.). For the monitoring of the biotope network, appropriate and effective indicator systems must be defined.

Impact

Ecological impact	
Other	Direct ecological impacts only arise as a result of the measures which are the focus of monitoring. Monitoring systems are appropriate, for example, to measure the impact of actions for the extensivisation of agriculture. Indicators can include the presence of specific rare plant species, for example.
Time of realisation for measure	Months: Biotope networking measures must be carried out before monitoring takes place.

Impact scope	Very localised (plot): Monitoring takes place on individual plots. The impact can be increased if entire regions participate in relevant programmes.

Implementation

Implementation period	Months: Appropriate training must be provided for farmers before monitoring commences.
Frequency	Recurring: Because of the high conceptual preparation and management cost this requires long-term implementation.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Preparation, training for participants, processing of results. A monitoring subsidy could also be paid to participants.
Socio-economic impacts	No direct impact: Compensation (payment of a subsidy) is possible to offset the moderate additional expenses incurred by farmers in conjunction with monitoring.
Sources of financing	Private sponsor, Public: local, Public: regional

Further information

Evaluation	In Vorarlberg, experience has been gathered with a programme to involve farmers in biodiversity monitoring ("Biodiversity Monitoring with Farmers" (BDMWF)). Similar approaches are being pursued in the Species-Rich Grassland Programme.
Information	Austria: Information is available, for example, at: http://www.vorarlberg.at/vorarlberg/umwelt_zukunft/umwelt/natur-undumweltschutz/foerderungen/oepul2007/naturschutzmassnahmenimoe.htm http://www.oekl.at/stories/storyReader$698

Hunting

Hunting ban areas, game protection areas, quiet zones, game reserves

In French game reserves, hunting is strictly prohibited. Habitat improvements should.
© Yann Kohler

Involved sectors

Agriculture, Forestry, Hunting, Nature protection, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

These various types of areas are intended to protect flora and fauna from disturbance or pressure from hunting. They are subject to different regulations, depending on the country or region: in Switzerland's "quiet zones" for game, for example, tourists, sportspersons and visitors may not leave the paths at specific times or enter the habitats of sensitive and rare species of fauna. Other activities such as skiing, snowshoeing, camping or organised sports events are also governed by specific rules. Alpine farming and agricultural/forest management are not affected by restrictions in the quiet zones, and hunting is also permitted. In France, on the other hand, hunting is strictly prohibited in the game reserves, as it is in Switzerland's hunting ban areas and game protection areas.

Impact in particular on	Big mammals

Ecological impact

Improvement or preservation of habitats	Designation of these areas is often accompanied by habitat improvement measures (in France, this is mandatory for game reserves under hunting legislation).

Element of ecological network	Depending on the size of the designated spaces, these areas can act as core zones or stepping stone biotopes in a biotope network, especially for sensitive species of bird and ungulates.
Time of realisation for measure	Immediate: A change in the behaviour of red deer, for example, in quiet zones can be observed within a short period (diurnal activity, confidence).
Impact scope	Local (municipality): Depending on species, the measure can have substantial local and regional impacts by reducing damage to agriculture and forestry; this is mainly dependent on the size of the designated zone.
Implementation	
Implementation period	Weeks: The administrative process involved in designation of a new area may take some time. In France, for example, the reserves are confirmed by the prefect by decree.
Frequency	Non-recurring
Economic and legal aspects	
Costs	Very low (less than 1'000 EUR): Costs arise solely in relation to the administrative process (planning, designation) and possibly publicity/signage.
Socio-economic impacts	Low: May help to prevent damage to agriculture and forestry in some regions.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national
Legal situation	The establishment of these areas is regulated by national and regional forest and hunting legislation. In France, 10% of the area of a communal hunting association (ACCA) must be designated a game reserve.
Further information	
Evaluation	Experience in Switzerland has shown that the game reserves enjoy wide acceptance among the local communities and sportspersons if appropriate information is provided. Hunters generally also respect the hunting bans in these areas.
Information	Other: Association of French Hunters: http://www.chasseurdefrance.com/ Swiss cantonal administrations (hunting departments), e.g. Obwalden Canton

Spatial planning

Taking account of the elements of ecological networks in planning tools (land-use plans, landscape development strategies etc.)

The dynamic character of the biotope network has to be maintained. © Rainer Sturm/ pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Hunting, Spatial planning, Tourism and leisure, Nature protection, Local population/citizens, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

The consideration of central elements of a biotope network in spatial planning is extremely important for the long-term and sustainable creation of a biotope network. This is the only way to ensure long-term connectivity. Planning must, however, be flexible enough to take account of the dynamic character of the biotope network. Depending on the type and significance of the elements, they should be taken into account in different tools and at different levels (at local level, areas for a small-scale network; at regional level, key migration corridors and solutions for major conflict points). There are already a number of examples in existence, notably in Switzerland with the creation of the REN in guidance planning (Richtplanung) or in France, where individual municipalities have incorporated elements of the local biotope network in their land-use planning.

Impact

Impact in particular on Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects, Fish

Ecological impact	
Reduction of fragmentation or creation of new valuable habitats	The consideration of the biotope network in spatial planning helps to avoid fragmentation in future.
Element of ecological network	The key elements of the biotope network are safeguarded for the long term.
Time of realisation for measure	Immediate: Spatial planning of key sites and structures avoids incorrect use and safeguards the long-term functionality of the network.
Impact scope	Local (municipality): Depending on the planning tool and the biotope network plan, may vary widely.
Implementation	
Implementation period	Months: Consideration in planning tools requires a very precise concept of the biotope network, mapping and coordination with other stakeholders - a lengthy process.
Frequency	Non-recurring, Recurring: Can only be effective as part of a long-term concept. Specific single actions can be implemented to preserve specific areas as part of that concept.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): Cannot be specified precisely. Planning is, however, very time-consuming and labour-intensive.
Socio-economic impacts	High: Numerous and diverse impacts on all stakeholders affected by the biotope network.
Sources of financing	Public: local, Public: regional, Public: national
Legal situation	Local, regional, state planning instruments.
Further information	
Evaluation	Inclusion of the elements of a biotope network in land-use planning is relatively new and much experimentation is under way. Questions about the best approach are still unresolved, especially as the network elements should have a dynamic character and no new "strictly protected areas" should be created.
Information	Other: e.g. in the French Region Rhône-Alpes, municipality of St. Martin d'Uriage, or Fribourg Canton in Switzerland.

Wildlife/ ecological spatial planning

Wild animals often cause damage in cultual landscapes. © Carsten Przygoda/ pixelio.de

Involved sectors

Agriculture, Forestry, Water management, Hunting, Spatial planning, Tourism and leisure, Nature protection, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Wildlife/ecological spatial planning (WÖRP) is an instrument developed in Austria and is used in a number of Austrian states, as well as the canton of Graubünden in Switzerland and Liechtenstein. The aim of this concept is better long-term incorporation of native species of wildlife into the cultural landscape. In this context, the protection and sustainable use of wildlife populations and the avoidance of damage to wildlife in agriculture and forestry are of key importance. An integrated planning approach aims to harmonise the creation of biotope networks with studies on game stocks and the carrying capacity of biotopes. WÖRP can be applied, in principle, to all wildlife species. It includes large-scale spatial planning (nationwide basic planning) related to the spatial distribution of wildlife populations and detailed regional planning.

Impact

Impact in particular on Big mammals, Birds

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	The aim of WÖRP is the conservation of species-appropriate coherent habitats for wildlife. Habitat connectivity is an essential part of habitat conservation.
Improvement or preservation of habitats	It includes habitat conservation and improvement measures, overwintering concepts for hoofed game, and minimisation of use-related conflicts.

Element of ecological network	Building on the results of WÖRP, appropriate connectivity measures are adopted, including the construction of green bridges.
Other	In infrastructural projects, WÖRP helps to provide an initial pointer to the significance of the habitat for wildlife, which can then be taken into account during planning.
Time of realisation for measure	Long term: Implementation of WÖRP is a long-term process which must constantly be adapted to changing conditions.
Impact scope	Regional: The regulations governing WÖRP divide the countryside into wildlife spaces, wildlife regions and wildlife zones. It involves regional planning across a wide area, which is intended to provide a basis for detailed local plans.
Implementation	
Implementation period	Months: As WÖRP is a complex planning tool requiring substantial information, the process takes time.
Frequency	Non-recurring: Single though long-term process; may require subsequent complementation or adaptation.
Economic and legal aspects	
Costs	High (100'000-1 Mio EUR): Dependent on many different factors (size of area, detail of plans, etc.) so varies widely from case to case.
Socio-economic impacts	High: May have considerable impacts on spatial planning, farming, hunting etc.
Sources of financing	Other private sources, Public: local, Public: regional, Public: national, Public: European
Legal situation	In Austria, specific regulations (WÖRP-Verordnung) governing WÖRP are in place. In some federal states in Austria, WÖRP is established in hunting legislation.
Further information	
Evaluation	Complex but successful planning tool which has also proved its worth in an international context (along the tri-border area between Austria, Switzerland and Liechtenstein). At international level, in conjunction with Natura 2000 and protected areas, WÖRP has found solutions to problems arising between protected and non-protected areas.

Information	Other: The Austrian states of Vorarlberg, Salzburg, Carinthia, and Liechtenstein, Graubünden (CH), and Austria's National Parks (Kalkalpen, Donau-Auen).
Contact	Austria: Salzburg federal state: Dipl.-Ing. Rupert Haupolter; Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna: Prof. Dr. Friedrich Reimoser

Tourism and leisure

Tourist marketing of the biotope network

A focused marketing enhances a regional ceation of value. © CIPRA International

Involved sectors

Agriculture, Forestry, Spatial planning, Tourism and leisure, Nature protection, Local population/citizens, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Valuable habitats of different species of fauna and flora also have high recreational value which, with appropriate sustainability strategies, can generate synergies between nature conservation and tourism strategies. On the one hand, appropriate tourist offers can inform visitors and guests about the biotope network. On the other, tourism can contribute to the conservation and protection of habitats. Corresponding effects can be achieved through an integrated marketing strategy in which the biotope network is actively promoted via the marketing and imparted through appropriate guided tours, for example. The focus should be on particularly attractive biotopes which also increase regional value-added (e.g. mixed orchards). In this way, sustainable agriculture, crafts and commerce in the region can be promoted and the biotope network will be increasingly appreciated in the long term by locals and visitors alike due to its positive economic effects.

Impact

Ecological impact

Other	The increased acceptance of biotope network measures is expected to create positive ecological impacts over the long term and more measures may be implemented on this basis.
Time of realisation for measure	Years: A long period of time is required to develop and implement suitable strategies and, similarly, it takes a long time for the impact to appear. However, acceptance can already be increased during the planning phase.
Impact scope	**Regional: Marketing strategies should preferably be implemented at regional level but a biotope network can be promoted at local level.**

Implementation

Implementation period	Years: It can be assumed that the implementation of the strategies will take a long time.
Frequency	Recurring: Realization is a long-term activity.

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): The costs for the planning process and for creating the appropriate structures are expected to be high, but can be integrated into existing planning processes.
Socio-economic impacts	Medium: Positive economic effects should be achieved if sound marketing strategies are developed.
Sources of financing	Private sponsor, Other private sources, Public: regional, Public: national

Further information

Evaluation	The "Experience the Green Belt" project in Germany is promoting the former inner-German border for tourism. It is combining nature conservation with 'soft' tourism to publicise this unique biotope network and draw attention to its importance for nature conservation.
Information	Germany: Information from the Federal Agency for Nature Conservation: http://www.bfn.de/0311_gruenes_band.htm Project website: http:/www.erlebnisgruenesbnad.de/
Good Practice	"Experience the Green Belt", Germany Exemple « Erlebnis Grünes Band » (À la découverte de la Trame verte), Allemagne Esempio "Esperienza nastro verde" in Germania

Trails to connect protected areas

Trails can draw attention to aspects of ecological connectivity. © Bollinger Hanspeter/ pixelio.de

Involved sectors

Spatial planning, Tourism and leisure, Nature protection, Local population/citizens, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

In Switzerland (Haute-Engadine, Haut-Valais, southern Tessin), the WWF, together with regional tourism offices, has created three transboundary Emerald Trails with a total of 50 stages. The stages and their attractions, as well as accommodation options, are described in detail on the Internet. The trails link various protected areas, Natura 2000 sites and emerald areas and can thus draw attention to aspects of ecological connectivity.

Impact

Ecological impact

Other	No direct ecological impacts are achieved, but information placed along the trails can raise awareness. Acceptance of biotope network measures is also increased in the long term.
Time of realisation for measure	Years: The use of good communication methods increases awareness of the issue immediately; acceptance within the general public only emerges after visible positive results.
Impact scope	Regional: The scope of implementation and impact are heavily dependent on the conditions in the regions and habitats concerned.

Implementation

Implementation period	Months: The development and promotion of the trails require a long planning phase.
Frequency	Non-recurring: Regular maintenance of, e.g., info boards.

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): The costs for planning, signage and advertising are expected to be high and will depend on the situation at the outset.
Socio-economic impacts	Medium: On the basis that the region is being made more attractive, positive economic impacts are expected.
Sources of financing	Private sponsor, Other private sources, Public: regional, Public: national

Further information

Evaluation	Tourist marketing initiatives can be combined with other measures (e.g. publicity events, volunteer programmes). In addition to the example in Switzerland, Germany and Austria also have similar initiatives relating to Natura 2000 sites (NaturaTrails of the Friends of Nature).

Information	Other: http://www.wwf.ch/de/derwwf/themen/alpen/wanderwege/index.cfm , http://www.naturfreunde-natura2000.de/ , http://www.naturatrails.at

Trail concepts and visitor guidance for winter sports

In Vorarlberg/A and Switzerland the cross-national campaign "Respektiere deine Grenzen" supports the creation of leasure areas for wild animals. © Thommy Weiss/pixelio.de

Involved sectors

Forestry, Hunting, Tourism and leisure, Nature protection, Other: Sports Associations

Affected habitats

Forest, Alpine habitats, Grassland

Description

Ski touring and snowshoeing have become increasingly popular winter sports in recent years, offering an experience of the winter landscape off the pathways and pistes. However, they take sportspersons into the refuge areas of wild animals, which are highly sensitive to disturbance in winter. For critically sensitive zones, the German Alpine Association (DAV) publishes information for touring skiers regarding recommended routes (this includes demarcation of sensitive areas, waymarking, and information boards and maps at car parks). Efforts are also being made to promote cooperation with the authors and publishers of guidebooks.

Impact

Impat in particular on Big mammals, Birds

Ecological impact	
Improvement or preservation of habitats	Disturbance in sensitive areas is avoided during the winter.
Element of ecological network	Demarcating quiet zones for game in winter creates important refuge areas which thus become winter core zones in a biotope network.
Other	In areas with emerging young forest stands, this measure can also help protect the young trees.
Time of realisation for measure	Immediate: Disturbance created by just a single winter sportsperson can have fatal consequences for sensitive species. Marking alternative routes prevents the animals from being disturbed.
Impact scope	Local (municipality): In the case of a regional or national initiative (e.g. by the German Alpine Association - DAV), or when a rare species of animal is involved (e.g. wood grouse - capercaillie), the impact can have a regional or even a national significance.
Implementation	
Implementation period	Months: Determining the sensitive routes or sections of routes, formulating alternatives, preparing the information campaigns and signage along the new routes require some preparatory work.
Frequency	Recurring: Time-consuming and costly preparation of measures needed. Their implementation requires optimal care and continuous adaptation.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Costs vary greatly depending on the project; besides labour, the main expenditure relates to publicity materials.
Socio-economic impacts	Low
Sources of financing	Private sponsor, Other private sources, Public: local, Public: regional
Legal situation	Voluntary collaboration of stakeholders.

Further information

Evaluation	There has been a very positive response and acceptance of the measures among ski tourers. Positive impacts, especially on grouse populations, have been demonstrated in various areas, including the German uplands. Information campaigns have been carried out in many different regions (especially protected areas); however, actual demarcation of alternative routes is less common.
Information	Germany: Information on the "Environment-friendly Ski Touring" project is available from the German Alpine Association at: http://www.alpenverein.de/ (keyword Environment-friendly ski touring)
Contact	Germany: Information on the projects in Berchtesgaden National Park: http://www.nationalpark-berchtesgaden.bayern.de-/01_nationalpark/01_aufgaben/09_management/-06_skibergsteigen/index.htm (en)
Good Practice	Environment-friendly ski touring, Berchtesgaden, Germany Le ski de randonnée respectueux de l'environnement Sci alpinismo compatibile con la natura

Agreements on environmentally compatible practice of sports with sportspersons and associations

Agreements with sportspeople can prevent disturbances in sensitive areas, e.g. on crags. © Yann Kohler

Involved sectors

Other: Sports Associations

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Many of the sports carried out in the natural environment can cause major disturbance and even the destruction of habitats. Mountain biking, paragliding, canyoning and climbing are just a few examples. In order to guarantee that sports are practised in a more environmentally compatible manner, agreements for sensitive areas can be reached with sports groups and associations. One example is the climbing strategy adopted by the German Alpine Association (DAV). Many rocky crags and rockfaces provide refuge for rare and protected species of flora and fauna. To ensure that these unique biotopes are not damaged by climbers, strategies for environmentally compatible climbing are both useful and necessary. The package of measures adopted by the German Alpine Association (DAV) on eco-friendly climbing involves working with public authorities and nature conservation organisations to develop climbing strategies. The DAV is relying on a wide variety of solutions to identify, at micro level, those areas where environmentally compatible climbing is possible and those where no climbing should take place in the interests of nature conservation. Uniform marking of crags, temporary closure of crags or sections of them, and local wardens with responsibility for crags are just some of the key elements of these strategies.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects, Fish

Ecological impact

Improvement or preservation of habitats	Many different plants and animals find their niche at close quarters between the foot of the rock walls and the top of the crags (lichens, peregrine falcon (Falco peregrinus), Eurasian Eagle Owl (Bubo bubo) and many types of insects). The temporary closure of crags or sections of them will prevent damage and disturbance.
Element of ecological network	In areas with few key crags or on those which are used widely for tourism, the implementation of this measure plays a key role, particularly within a biotope network.
Time of realisation for measure	Immediate: To protect rocky crags and rockfaces which are breeding places, it is particularly important that the impact is immediate and that no disturbance occurs. Gaining the long-term acceptance of sportspersons and implementing a broad-based standard procedure will take longer.
Impact scope	Local (municipality): The impact occurs directly on the rocky crags and rockfaces concerned. However it can have a regional or transregional significance, such as in the case of the successful breeding of a rare and sensitive species.

Implementation

Implementation period	Weeks: Signage and closures can be set up quickly. Training and 'educating' the sportspersons, establishing a standard marking system etc. are long-term goals.
Frequency	Non-recurring: Time-consuming and costly preparation of measures needed. Their implementation requires optimal management and continuous adaptation.

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): The work involved in implementing this strategy is mainly carried out by volunteers (local wardens with responsibility for crags). Costs for information materials and signage are incurred.
Socio-economic impacts	No direct impact
Sources of financing	Public: local, Public: regional, Public: European
Legal situation	Voluntary collaboration with sportspersons and sports associations.

Further information

Evaluation	Through a contractual (voluntary) agreement, acceptance of the requisite measures among stakeholders is very high. The easing of burdens on the authorities and the ensuing cost savings, as well as the high degree of flexibility, also testifies to the usefulness of this approach. If monitoring of the scheme's success brings new scientific knowledge to light, the arrangements can be adapted without major organisational or financial effort.
Information	Germany: Comprehensive information about the climbing strategies and environmentally compatible climbing is available from the rock information system: www.dav-felsinfo.de (de)
Contact	Germany: DAV contact person on the subject of climbing and nature conservation: Jörg Ruckriegel.
Good Practice	Climbing strategies: an environmentally friendly approach to climbing, Germany Programmes d'escalade – L'escalade respectueuse de la nature Alpinismo – Arrampicate compatibili con la natura

Flight bans over sensitive areas

Various types of sport may also have a negative impact. © Manfred Schimmel/ pixelio.de

Involved sectors

Tourism and leisure, Nature protection, Local population/citizens, Other: Sports Associations

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Many near-natural landscapes and landscapes which are valuable from a nature conservation perspective are very attractive recreational spaces, for besides offering ideal conditions for sports and leisure, they also offer very special experiences of nature. With the increasing pressure of use, however, conflicts can emerge between the interests of “nature consumers” and nature conservation objectives. These may affect areas which constitute important habitats for rare and sensitive species and which are of major importance for the biotope network. Various types of sport (kite-flying, paragliding, gliding) may also have a negative impact. With the development of quiet zones and the simultaneous creation of alternative offers for sportspersons and holiday-makers in areas which are relatively tolerant of disturbance, incentives can be created for sportspersons to abandon those areas which are highly sensitive to disturbance. The provision of attractive substitute sites is intended to create “win-win situations”.

Impact

Impact in particular on	Small mammals, Big mammals, Birds
Ecological impact	
Improvement or preservation of habitats	Calming measures for individual areas particularly sensitive to disturbance lead to an improvement in the habitat quality of sensitive species (e.g. black grouse).

Element of ecological network	Depending on the quality of the areas and on the species occuring in them, valuable areas from a nature conservation perspective constitute important elements of an ecological network.
Time of realisation for measure	Immediate: The positive impacts of suitable strategies are noticeable immediately after implementation; long-term acceptance, however, will probably only emerge over time.
Impact scope	Regional: Strategies should be planned with a broader spatial perspective, otherwise conflicts will merely be shifted into neighbouring areas.
Implementation	
Implementation period	Years: The procedure should be based on intensive participation by all stakeholder groups to enable feasible solutions, with majority support, to be developed for the conflict situation.
Frequency	Recurring: Requires long-term action adapted to actual needs.
Economic and legal aspects	
Costs	Medium (10'000-100'000 EUR): The planning process, which is based on the involvement of all stakeholders, requires a long period of time, and scientific studies must be produced.
Socio-economic impacts	Low: No negative impacts are expected if alternative flight areas are provided.
Sources of financing	Private sponsor, Public: local, Public: regional, Public: national, Public: European
Legal situation	Voluntary agreement.
Further information	
Evaluation	In the Upper Rhön region (Bavaria, Germany), as part of a close cooperation between aviation sport and nature conservation representatives, an agreement was formulated between 1998 and 2003 which was supported by the Federal Agency for Nature Conservation (BfN). The agreement between the Society for the Promotion of Gliding on the Wasserkuppe and the Biosphere Reserve Authority contains clear and tried-and-tested regulations.
Information	Germany: A project report published in the BfN-Skripten series is available on the internet and contains information on the entire planning process: http://www.bfn.de/fileadmin/MDB/documents/skript83_text.pdf
Contact	Germany: Expert support at the Federal Agency for Nature Conservation: Michael Pütsch

Communities

Biotope network plans on the local scale

To implement the right measures in the right way and in the right place an area-wide biotope network plan is necessary. © Wikipedia commons

Involved sectors

Agriculture, Forestry, Water management, Fishery, Hunting, Spatial planning, Tourism and leisure, Nature protection, Transport, Local population/citizens, Municipalities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Targeted and functional measures are important for effective biotope networking. An area-wide biotope network plan is essential if the right measures are to be implemented in the right way and in the right place. At the level of the local authority, priority areas for the biotope network can be included in the appropriate planning documents. This permits the land use interests of the various sectors to be weighed up at the same time. Ecological interests and development potential for the residential and economic area need not necessarily conflict.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects, Fish

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	High-level biotope network planning can help reduce habitat fragmentation. In the best case, the combined plans of several local authorities constitute a supra-regional biotope network concept.

Improvement or preservation of habitats	Individual biotope improvements derive from development and improvement measures taken in the framework of the biotope network concept.
Element of ecological network	Targeted improvements are made to the individual elements of the local biotope network.
Time of realisation for measure	Immediate, Weeks, Months: Biotope network planning at the municipal level combines various measures with diverse effects in a range of sectors.
Impact scope	Local (municipality), Regional, Transregional: Depending on the actual design and integration of the local authority's biotope network concept in the higher-level planning process, the measures can have regional and supra-regional effects.

Implementation

Implementation period	Years: Field data capture and the subsequent concept design phase take time. Several years may elapse between the initial planning phase and final implementation.
Frequency	Non-recurring, Recurring: The biotope network concept and related planning documents need to be updated every few years. Some of the measures involved may only need to be taken once.

Economic and legal aspects

Costs	Medium (10'000-100'000 EUR): The costs of the concept can vary significantly depending on the data already available.
Socio-economic impacts	No direct impact: Promotion of the plans for a biotope network can have positive effects on the regional economy(e.g. tourism). Benefits may also derive from the clear planning specifications.
Sources of financing	Private sponsor, Public: local, Public: regional
Legal situation	Local biotope network concepts should be integrated in the relevant planning instruments in the interest of a strong legal position in the implementation phase.

Further information

Evaluation	In Neumarkt in the Salzburg region of Austria, such a concept was developed in 2007-2009 and integrated in the local spatial development plan.
Information	Austria: To obtain further information or order the Neumarkt report go to: http://www.vielfaltleben.at/article/articleview/81282/1/29332

Contact Austria: Office of the Salzburg Regional Government, Department of Nature Protection

Population

Near-natural gardening

Near-natural gardens ideally offer a large number of structures and biotopes for a wide range of species of flora and fauna. © CIPRA International

Involved sectors

Local population/citizens, Municipalities

Affected habitats

Areas for settlements and transport

Description

Near-natural gardens with large quantities of robust indigenous trees and shrubs, herbs and other plants are an asset for built-up areas that can also contribute to the creation of biotope networks. Near-natural gardens ideally offer a large number of structures and biotopes for a wide range of species of flora and fauna. Dry stone walls, piles of stones and twigs, deadwood, fruit trees and ponds all play an important role as living spaces, refuges, sources of food, and hunting and nesting grounds. In the near-natural garden, the compost used as fertiliser completes the natural cycle. Synthetic products such as pesticides, herbicides and mineral fertilisers are superfluous.

Impact

Impact in particular on Small mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Near-natural design enhances the garden's suitability as a biotope for various small mammals, amphibians, reptiles and insects.
Element of ecological network	In combination with other near-natural spaces, near-natural gardens can form part of a local biotope network.
Time of realisation for measure	Immediate, Weeks: Depending on the timing of the measures, the effects can be seen in the current vegetation period already.
Impact scope	Very localised (plot), Local (municipality): Individual near-natural spaces can form part of a local biotope network.

Implementation

Implementation period	Days, Weeks: Some measures can be implemented immediately(replacement with indigenous species, discontinued use of artificial fertilisers) whereas others take more time and effort (building a dry-stone wall or creating a pond).
Frequency	Non-recurring, Recurring: Depending on the specific solutions selected, one-off or repeated activities may be required.

Economic and legal aspects

Costs	Very low (less than 1'000 EUR): Most measures can be implemented at little expense and may even save money.
Socio-economic impacts	No direct impact: Depending on the plants chosen for the near-natural garden, some can be used in the kitchen.
Sources of financing	Private sponsor, Public: local, Public: regional

Further information

Evaluation	A number of programmes have been launched in support of near-natural gardens, but there is rarely any higher-level planning for a biotope network.
Information	Austria: Austrian programme entitled "Natur im Garten": http://www.gemeinden.umweltberatung.at/start.asp?b=3608 Germany: Tips for laying out a near-natural garden available from Naturschutzbund Deutschland: http://hamburg.nabu.de/projekte/garten/gartentipps/05213.html

Other .

Connectivity measures with support from church-owned land

The churches are important owners of land and farmland. © Rainer Sturm/ pixelio.de

Involved sectors

Agriculture, Forestry, Nature protection, Local population/citizens, Other: Church

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

The churches are important owners of land and farmland which are also suitable for the creation of a network of interlinked biotopes, and can thus serve as an important partner in the planning of biotope network measures. If the church backs the development of a biotope network and works actively to ensure that appropriate measures are implemented on its property, the tenants can also be sensitised to the importance of the biotope network, and the tenancies are then linked to the implementation of relevant measures. In order to increase acceptance of the biotope network and plan appropriate measures, the planning process should involve as many different stakeholders as possible (besides church workers, this should include nature conservation experts, local community representatives, farmers etc.). Appropriate public relations work can be used to encourage similar initiatives in other regions.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	Depending on the measures and habitats concerned, the quality of individual habitats is improved.
Element of ecological network	With appropriate planning, church land can form elements of an ecological network, perhaps even on a transregional basis.

Time of realisation for measure	Months: The impacts depend heavily on the measures and ecosystems concerned.
Impact scope	Local (municipality): Integrating the measure into an overall strategy increases its impact accordingly.
Implementation	
Implementation period	Months: Here, too, the duration of the measures to be implemented is dependent on the measures involved, and the preparation and planning will also take time.
Frequency	Non-recurring, Recurring: Single or repeated action, depending on type of measure.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): Many different measures can be planned and implemented depending on the situation at the outset and the conditions of the land involved.
Socio-economic impacts	Low: Subsidies can increase the incomes of the farmers involved or can offset any additional costs incurred.
Sources of financing	Private sponsor, Public: local, Public: regional
Legal situation	Suitable measures can be promoted by cultural landscape and countryside management programmes.
Further information	
Evaluation	Two such initiatives have already been implemented in Germany which have been very successful and are to be continued (a biotope network with church land in Bavaria and a biotope network with the help of church land in Saxony-Anhalt).
Information	Other: http://www.pan-partnerschaft.de/faltblatt/naila.pdf https://www.dbu.de/projekt_18212/_db_1036.html oder http://www.kfh-wb.de/projekte/biot.htm
Contact	Germany: Information from the Association for the Protection of Nature in Bavaria (BN), Hof group, contact person: Klaus Schaumberg

Environmentally compatible design of power lines

Power lines are shaping the landscape now for about hundred years.
© Cornerstone/pixelio.de

Involved sectors

Agriculture, Forestry, Hunting, Spatial planning, Tourism and leisure, Nature protection, Other: Energy

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

Power lines have been a feature of the landscape for almost 100 years. At present, there is virtually no alternative to them when it comes to Europe's extra high voltage sector. Wide aisles of low-growing woodland emerge, particularly when the conductor cables cross large forest areas at the normal height. Nonetheless, there are still interesting options to promote ecoconnectivity in this cultural landscape, even in areas with encroaching woodland growth due to lack of agricultural use. With well-thought-out and systematic biotope management planning, these areas can become important habitats, connecting routes, stepping stones and corridors in the biotope network.

Impact

Impact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects

Ecological impact

Improvement or preservation of habitats	With well-thought-out and sensible biotope management planning, various habitats and biotopes can be created in the aisles beneath power lines.
Element of ecological network	With appropriate design, there are good opportunities for these routes to become corridors and newly created or maintained biotopes can become stepping stones or even core areas.

Time of realisation for measure	Long term: The development of their impact as elements of a biotope network requires careful planning and a long-term design and maintenance process.
Impact scope	**Local (municipality): A regional strategy is imperative, but the impact will generally have local significance only.**
Implementation	
Implementation period	Months: The overhead power line network is very large. Individual measures like creating special new biotopes happen relatively quickly, but action on a broader basis is a task that will take many years.
Frequency	Recurring: Requires long-term measures.
Economic and legal aspects	
Costs	High (100'000-1 Mio EUR): Costs vary depending on the project being planned. The maintenance measures in the aisles must, however, take place regularly, involving continuous labour costs.
Socio-economic impacts	Low: The landscape is upgraded, especially areas with overhead power lines, which are generally viewed in negative terms.
Sources of financing	Other private sources, Public: regional, Public: national
Further information	
Evaluation	Individual examples with committed energy suppliers and well-thought-out strategies can produce very good results, particularly in terms of connectivity. However, there are areas where overhead cables should definitely be removed and laid underground.
Information	Other: Information on biotope management in power line routes can be obtained from energy supplier RWE, for example.
Contact	Switzerland: Expert at the Swiss Federal Institute of Technology, Zurich: Dr. Thomas Coch, nature and landscape conservation

Determination of light pollution

Light pollution denotes the brightening of the night sky caused by artificial light sources. © Helmut J. Salzer/ pixelio.de

Involved sectors

Tourism and leisure, Nature protection, Transport, Local population/citizens, Other: Districts and other local authorities

Affected habitats

Areas for settlements and transport

Description

The term “light pollution” denotes the brightening of the night sky caused by artificial light sources whose light is dispersed into the atmosphere. This can have various effects: the growth cycle of plants, for example, may be influenced by an artificially brightened environment. The sensory organs of nocturnal animals are specially adapted to night-time conditions, which makes them particularly sensitive to artificial light. Animals therefore attempt to avoid sources of light, so a well-lit street can therefore constitute a major barrier and contribute to habitat fragmentation. A large proportion of light pollution comes from poorly constructed or poorly installed light sources and can be avoided without any negative impacts, e.g. on road safety. An audit of public lighting can help to identify problem areas and offer appropriate solutions.

Impact

Impact in particular on Small mammals, Big mammals, Amphibians, Birds, Insects

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Brightly lit roads and residential areas, but also ski slopes, natural and cultural monuments, and floodlights from nightclubs can have substantial barrier effects at night.
Improvement or preservation of habitats	Bright lighting affects all nocturnal animals. Intensive lighting can also disturb the growth of plants. Reducing the intensity of lights can therefore help to improve their habitats.

Time of realisation for measure	Immediate: Reducing light intensity creates positive effects immediately.
Impact scope	Local (municipality): In sensitive areas, e.g. the migration routes of birds or bats, the measures taken locally to improve the lighting situation can have transregional significance.
Implementation	
Implementation period	Months: Carrying out the audit can take a relatively long time, depending on the data. The proposed improvements will be implemented over the long term and will depend on the budget and decisions made.
Frequency	Non-recurring: Measures should be followed by an evaluation of their success.
Economic and legal aspects	
Costs	Low (1'000-10'000 EUR): This type of audit will cost between €2,000 and 10,000, depending on the size of the municipality, the number of light sources, and the availability of data. Subsidies from the public purse may be available up to around 80% of the costs.
Socio-economic impacts	High: After such an audit, It is estimated that municipalities can cut their energy costs by 20-40% through targeted investment.
Sources of financing	Public: local, Public: regional, Public: national, Public: European
Further information	
Evaluation	Besides the positive impacts on nocturnal animals, the scheme also has positive effects on human health, not to forget the cost savings through better thought-out lighting.
Information	Other: Comprehensive information on the issue of light pollution is available from the International Dark-Sky Association http://www.darksky.org/ (en)
Contact	France: e.g. ADEME (French Environment and Energy Management Agency) in France http://www2.ademe.fr/ (fr, en)
Good Practice	Light pollution/light smog audits, Isère, France Diagnostic de la pollution lumineuse Diagnostica dell'inquinamento luminoso

Safety measures on electricity masts and cables

The energy supply is generally reliant on a dense network of overground cables. © K.T./ pixelio.de

Involved sectors

Nature protection, Other: Energy

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

In the Alps, too, the energy supply is generally reliant on a dense network of overground cables. For birds, especially migratory species, these cables – and to an even greater extent, dangerously constructed electricity masts – pose a major hazard. Masts are a popular roosting and resting place for many species of bird. The type of mast construction determines whether these are safe places for birds. On many masts in the mid-voltage network, for example, the arrival or departure of a bird in flight may trigger an earth fault or short circuit which kills the bird. For large species of bird in particular, such as white and black storks, the Eurasian Eagle Owl (Bubo bubo), Lesser Spotted Eagle (Aquila pomarina) and Griffon Vulture (Gyps fulvus), electrocution by power lines is now one of the main causes of population decline. In areas which birds regularly fly over in large numbers at low altitude (e.g. topographical bottlenecks in valleys), the cables should be laid underground or the areas bypassed altogether. If this is not possible, safety measures should be applied to cables and masts.

Impact

Impact in particular on Birds

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Safety measures for cables are a priority, particularly In EU bird protection areas, near the breeding places of endangered species, in rubbish dumps, water bodies and wetlands.

Improvement or preservation of habitats	Safeguards roosting and resting places for both migrating and sedentary birds.
Time of realisation for measure	Immediate: Once the safety measures have been completed, the birds are no longer in danger.
Impact scope	**Very localised (plot): Although the direct impact of the measure is local, entire populations can be affected in terms of the number of birds killed.**
Implementation	
Implementation period	Years: The application of safety measures to masts and other technical structures over a wide area depends on the number of masts and the density of the supply network, and can be very time-consuming.
Frequency	Non-recurring
Economic and legal aspects	
Costs	Very high (>1 Mio. EUR): Applying safety measures to masts and cables over a wide area will incur very high costs (up to several millions of euros).
Socio-economic impacts	Low
Sources of financing	Other private sources, Public: local, Public: regional, Public: national
Legal situation	The application of safety measures to masts and other technical structures associated with overhead energy cables is already established in law in many countries, eg in the German Federal Nature Conservation Act.
Further information	
Evaluation	Numerous international and national ornithological and nature conservation societies, along with research institutions and nature protection authorities have produced comprehensive investigations and studies, which present in detail the technology for bird-friendly cable construction and the ways of making dangerous masts safe. The decline in mortality on refurbished masts has been proved scientifically.

Information	Other: Nature Conservation and Biodiversity Union (NABU) brochure: Vorsicht Stromschlag! - recommendations for protecting birds on overhead power cables. Europarat / Conseil de l'Europe (2006) : Lignes à haute tension - comment protéger les oiseaux. Sauvegarde de la nature n°140. Strasbourg, 76 p.
Contact	Other: NABU – Federal working group on birds and powerlines. http://www.birdsandpowerlines.org/ BirdLife International
Good Practice	Marking of power lines and appropriate design of electricity pylons Signalisation des lignes électriques et aménagement des pylônes électriques Visualizzazione degli elettrodotti e configurazione dei tralicci

Corridor contracts

Region Rhône-Alpes/F contributes with corridor contracts to the ecological connectivity. © Franz Schutze/Zeitenspiegel

Involved sectors

Other: Districts and other local authorities

Affected habitats

Forest, Shrubs and wooded areas, Bogs and fens, wetlands, Alpine habitats, Grassland, Arable land, Areas for settlements and transport, Waterbodies

Description

In 2008, the French region of Rhône-Alpes completed the mapping of its regional ecological network. In order to support projects and initiatives which contribute to maintaining or improving ecological connectivity, the region offers so-called “corridor contracts”. Ideally, projects receiving support should involve several local authorities. Contracts are awarded for a period of five years. Support is provided for schemes which directly help to maintain or improve connectivity, as well as to schemes which aim to safeguard the elements of a biotope network in the long term via planning tools, environmental education and public relations work. A guide has been produced for prospective stakeholders which contains detailed information on the regional scheme and the contractual process.

Impact

Imact in particular on	Small mammals, Big mammals, Reptiles, Amphibians, Birds, Insects, Fish

Ecological impact

Reduction of fragmentation or creation of new valuable habitats	Measures to reduce fragmentation are being promoted.
Improvement or preservation of habitats	Measures to improve habitats are being promoted.
Element of ecological network	Measures to create elements and structures of a biotope network are being promoted.
Other	Measures regarding environmental education, public relations work etc. are being promoted.
Time of realisation for measure	Immediate: The support becomes available immediately after the contract is approved and for a period of 5 years.
Impact scope	**Regional: The scope of impact and implementation can differ greatly depending on the project being promoted, however, as a rule, several local authorities should be involved.**

Implementation

Implementation period	Long term: The contracts are concluded for a period of 5 years.
Frequency	Non-recurring, Recurring: Individual measures should be part of an overall concept and be executed over a number of years (say, 5). Some measures only need to be taken once.

Economic and legal aspects

Costs	High (100'000-1 Mio EUR): On average, support is available for 50% of the costs of the project. The highest subsidy rate is €1 million per contract or €200,000 per year. The overall budget for the region is set once the pilot projects have been evaluated.
Socio-economic impacts	Medium: Dependent on the project being supported.
Sources of financing	Public: regional
Legal situation	A 5-year contract between one or several local authorities and the region.
Further information	
Evaluation	The first contract, for the Gresivaudan Valley in the Département Isère, France, was signed in February 2009, so an evaluation of the tool has not yet been possible.
Information	France: Rhône-Alpes region http://biodiversite.rhonealpes.fr/spip.php?rubrique2/ http://www.rhone-alpes.ecologie.gouv.fr/
Contact	France: Person responsible in the Rhône-Alpes region: Hélèn Guilloy

V BUONE PRATICHE

Le misure selezionate che appaiono particolarmente interessanti per l'approccio innovativo, l'originalità o la realizzazione esemplare, sono descritte in maniera più dettagliata sulla base di esempi o di progetti concreti. Tali esempi di applicazione ti daranno un forte incitamento, ma anche informazioni pratiche come contatti e referenze.

Protezione dell'ambiente

Rinaturalizzazione delle torbiere: l'esempio della Allgäuer Moorallianz

Le torbiere e i prati da strame della Allgäuer Moorallianz appartengono alle aree palustri più ricche e significative di tutta la Germania. La transizione fra torbiere alpine e prealpine vi è molto ben conservata. Nella regione dei pascoli ad uso collettivo dell'Algovia orientale vi è una presenza importante di pascoli paludosi. Questo territorio ospita inoltre numerose specie tipiche delle torbiere quali il Colias palaeno e l'Aeshna celeste, e più di 90 specie fortemente a rischio o a minaccia di estinzione (Lycaena helle, Nehalennia speciosa e il marasso [Vipera berus]).

© Bund Naturschutz Ostallgaeu

Per proteggere e conservare questa importante eredità naturale, autorità, Comuni e associazioni hanno creato la Allgäuer Moorallianz. L'Alleanza ha come obiettivo la conservazione e la rinaturalizzazione delle torbiere dell'Algovia. Essa riunisce gli attori più vari, fra cui agricoltori e autorità, scuole e associazioni paesaggistiche, enti turistici e ambientalisti. In molti casi i prati umidi e da lettiera sono stati drenati, intensivizzati e sostituiti da prati-erbai. Sulle superfici ad uso agricolo domina l'allevamento di bovini da latte e, alle altitudini maggiori, prevale il ruolo degli alpeggi. Complessivamente più del 90% delle torbiere dell'Algovia sono state drenate o hanno subito danni di altro genere. Solo il 5-10% invece è ancora allo stato seminaturale e solo l'1% è naturale.

Il progetto "Allgäuer Moorallianz" si propone perciò come obiettivo la protezione e lo sviluppo delle più pregiate zone centrali delle torbiere dell'Algovia attraverso un bilancio idrico intatto ed un uso adeguato . A questo scopo ci si propone di attuare misure quali la riumidificazione delle torbiere alte e di transizione, lo smantellamento dei drenaggi e una riconversione seminaturale dei corsi d'acqua. Oltre a ciò si punta nuovamente ad una gestione compatibile con la natura della cintura di verde attorno alle torbiere con l'adozione di forme d'uso adatte

quali la fienagione e il pascolo. Anche le aree particolarmente pregiate quali i corsi e specchi d'acqua all'interno delle torbiere, particolarmente sensibili al calpestio, e le sorgenti meritano una protezione particolare e i prati magri ricchi di specie devono essere ricostituiti. Con misure apposite di diradamento si punta a favorire lo sviluppo di zone di transizione boschi-prati aperti quali habitat per il gallo cedrone e il fagiano di monte.

Accanto ai numerosi obiettivi di protezione della natura, la Allgäuer Moorallianz punta anche su tutta una serie di aspetti socio-economici. Fra questi si annoverano la sensibilizzazione e l'informazione della popolazione e dei decisori politici. Si tratta anche di valorizzare aree idonee per il tempo libero, la ricreazione e il turismo per favorire in questo modo un "turismo delle torbiere". Il progetto comprende anche strategie di commercializzazione dei prodotti agricoli risultanti dalle misure di cura e manutenzione, fra cui la vendita dello strame dei prati da lettiera attraverso un'apposita borsa. Per favorire l'attrattiva turistica della regione si punta fra l'altro a sviluppare sentieri tematici che al contempo consentono di gestire i flussi di visitatori. Un complesso programma di formazione ambientale offre visite guidate, escursioni, giornate dedicate a progetti, p. es. con le scuole, e si rivolge in particolare anche alla popolazione locale. In questo ambito, accanto agli aspetti di protezione della natura, viene ribadita anche l'importanza delle torbiere in relazione alla protezione del clima e alla difesa dalle inondazioni.

Bilancio

Il progetto "Allgäuer Moorallianz" mette insieme un gran numero di attori diversi e contribuisce in modo significato ai corridoi biologici. Il progetto promuove e valorizza le zone palustri in un sistema regionale. In virtù degli obiettivi complessi che riuniscono aspetti di protezione della natura a quelli socio-economici e idee pratiche di implementazione, esso segue un approccio innovativo per la valorizzazione del potenziale dello spazio naturale. Nell'ambito del Premio "Idea natura" dell'Ufficio Federale per la Protezione della Natura, il progetto ha vinto il primo livello del concorso e potrà eventualmente essere finanziato come grande progetto di protezione della natura.

Contatto e ulteriori informazioni

Concorso "Idea natura" dell'Ufficio Federale per la Protezione della Natura
http://www.idee-natur.de/wettbewerb.html (de)

Informazioni presso l'Associazione di Protezione della Natura in Baviera
http://www.kempten.bund-naturschutz.de/index.php?id=6263 (de)

Messa in rete degli habitat dei pipistrelli nell’arco alpino

Nell’ambito del Progetto INTERREG IIIB Messa in rete degli habitat (“Living Space Network”) sono stati sviluppati alcuni concetti e misure di protezione transfrontalieri per le popolazioni di chirotteri alpine. I principi elaborati in questo ambito forniscono spunti preziosi per misure atte alla conservazione e messa in rete di habitat di interesse per i chirotteri.

© IRKA

Grazie alla sua alta naturalità e alla diversità paesaggistica, lo spazio alpino è caratterizzato da una vasta fauna di chirotteri. In considerazione delle particolari esigenze dei pipistrelli nei confronti del proprio habitat, essi sono di particolare importanza per i corridoi biologici. Essi dipendono infatti da una grande varietà di strutture messe in rete. I pipistrelli utilizzano habitat molto diversi nel corso delle varie stagioni e delle varie ore del giorno, che possono anche essere a distanze di diverse centinaia di chilometri fra loro. Essi hanno infatti bisogno di habitat-rifugio e di aree idonee per la caccia, fra cui boschi allo stato seminaturale e paesaggi rurali ricchi di strutture.

Un risultato importante del progetto di protezione dei chirotteri è stata la redazione di una complessa guida alla ristrutturazione edilizia che specifica le esigenze in termini di quartieri per circa 20 diverse specie di chirotteri che prediligono gli edifici come dimore. Molte specie di pipistrelli ricorrono agli edifici quale dimora in quanto i quartieri naturali sono diventati molto rari in seguito alla gestione intensiva dei boschi. Nei risanamenti e nelle ristrutturazioni di vecchi edifici è perciò facile che i pipistrelli vengano disturbati. Complessivamente nella guida sono stati inseriti 230 esempi di risanamenti, in prevalenza riferiti all’arco alpino. La guida di ristrutturazione fornisce informazioni sull’ecologia delle dimore a livello di specie, ad es. in relazione all’utilizzo nello spazio e nel tempo, e le principali caratteristiche delle dimore. Con esperienze alla mano si illustrano altresì le reazioni ai disturbi ed ai cambiamenti delle dimore e si forniscono direttive per le misure di risanamento che riguardano le singole specie.

Oltre a ciò, nell’ambito del progetto sono stati promossi gli habitat di caccia del vespertilio minore [Myotis blythii]. A questo scopo è stato elaborato un sistema transfrontaliero per la conservazione degli erbai seminaturali. Con un miglioramento mirato degli habitat si punta ad aumentare l’offerta di potenziali habitat di caccia e l’offerta alimentare in genere, raggiungendo così uno sviluppo positivo della popolazione di pipistrelli. A seconda della regione e delle condizioni specifiche si possono rendere necessarie misure molto diverse per la valorizzazione degli habitat di caccia. Nel paesaggio in prevalenza sottoposto ad una

gestione intensiva, l'estensivizzazione delle superfici agricole o la ricostituzione di prati ad uso estensivo possono produrre un effetto positivo. In questo senso il momento e la frequenza dello sfalcio e la rinuncia alla concimazione sono di fondamentale importanza. In altre regioni invece l'abbandono dell'agricoltura con la conseguente progressiva chiusura causata da formazioni cespugliose ed arbustive può comportare un rischio per i potenziali habitat di caccia. In tal senso in queste aree è necessario sviluppare misure e strumenti diversi. L'incentivazione degli habitat di caccia per i pipistrelli non va poi vista separata dalle misure per la protezione delle colonie di riproduzione. Si tratterà invece di sviluppare un approccio complessivo che tenga conto delle differenti esigenze di habitat dei chirotteri.

Accanto ad altri progetti per la protezione mirata dei pipistrelli nelle Alpi, nell'ambito del progetto di messa in rete degli habitat sono state organizzate diverse manifestazioni ed azioni efficaci rivolte al grande pubblico. Fra questi va menzionato un convegno internazionale sul tema, nonché azioni di accompagnamento finalizzate alla sensibilizzazione della popolazione.

Bilancio

Nell'ambito del progetto INTERREG è stata elaborata una serie di diversi approcci che possono contribuire alla protezione dei pipistrelli nell'arco alpino. Proprio la guida di risanamento è un ottimo strumento per poter realizzare ristrutturazione e risanamenti tenendo conto delle esigenze dei pipistrelli. I sistemi sviluppati possono avere successo solo se applicati nella pratica e se continuamente sviluppati.

Nella pianificazione di misure in relazione ai corridoi biologici a favore dei chirotteri, i risultati del progetto possono costituire una base molto preziosa. Essi forniscono un gran numero di spunti a livelli molto diversi.

Contatto e ulteriori informazioni

INTERREG IIIB Messa in rete degli habitat, sottoprogetto chirotteri, con una guida alla ristrutturazione: http://www.lsn.tirol.gv.at/it/index.htm (de, it)

Agricoltura

Misura nel Parco naturale regionale “Massif des Bauges”, Francia

L’inventario delle specie di un erbaio rispecchia la sua gestione e il relativo sito. A parità di gestione, la composizione delle specie rimane pressoché costante. Questo fatto permette di legare l’incentivazione degli erbai estensivi alla presenza di specie vegetali caratteristiche. L’attuazione di questo approccio innovativo è facilitata da un catalogo di fiori di campo che consenta in modo semplice di riconoscere con sicurezza erbai estensivi e ricchi di specie.

© Caroline Begle

Nell’ambito del programma “Prati fioriti” l’incentivazione avviene in funzione della presenza di determinate specie vegetali facili da riconoscere (specie indicatrice). L’osservanza degli impegni presi viene monitorata tramite un metodo di controllo appositamente studiato direttamente in loco. A questo fine, nel periodo prima del primo taglio (a seconda dell’altitudine e dell’andamento fenologico, tra la metà di maggio e la metà di giugno), gli agricoltori si recano sui propri terreni secondo un metodo prescritto ed annotano le specie indicatrici individuate. Quando sulle superfici in questione viene individuato un certo numero delle diverse specie guida, l’agricoltore ha diritto ad una ricompensa.

La misura è basata sulla partecipazione volontaria. Gli agricoltori interessati si impegnano a conservare la ricchezza di specie sui loro erbai (prati e pascoli). Per il raggiungimento di questi risultati, agli agricoltori non vengono imposti né divieti né procedure specifiche da seguire. Infatti si tiene conto delle conoscenze tecniche e della responsabilità degli agricoltori che vengono al contempo sensibilizzati ai temi quali la protezione della natura e la biodiversità. Per diffondere ulteriormente la conoscenza di questa misura, una volta all’anno i prati più belli vengono premiati nell’ambito di un concorso.

Nel Parco naturale Massif des Bauges, la misura è stata introdotta nel 2006. Nel maggio 2008 vi avevano partecipato già 70 agricoltori con una superficie complessiva di circa 1000 ettari. L’incentivo è di 89 € per ettaro di tutte le superfici che partecipano al programma.

Bilancio

Le esperienze nel Parco naturale regionale “Massif des Bauges” sono decisamente positive. La nuova incentivazione di prati e pascoli ricchi di specie orientata al raggiungimento degli obiettivi è ben accetta dagli agricoltori in quanto vengono sostenuti senza norme e impegni aggiuntivi, sulla base del risultato del loro lavoro. Vengono rispettate le loro esperienze e

conoscenze specifiche. Anche i collaboratori del Parco naturale che accompagnano la misura traggono un bilancio positivo in quanto, esonerati dalla loro funzione di controllo, affiancano gli agricoltori come consulenti permettendo la nascita di nuove forme di comunicazione e cooperazione.

Il programma “Prati fioriti“ del Parco naturale des Bauges rappresenta una misura ancora relativamente giovane. Nel Baden-Württemberg (Germania) questa misura è adottata con successo fin dal 2002. Nell’ambito dei programmi MEKA II e III sono più di 10.000 gli agricoltori che vi partecipano. Anche in Francia sono otto i parchi naturali a sperimentare programmi simili per promuovere gli erbai ricchi di biodiversità.

In Germania, un’analisi pluriennale ha permesso di documentare gli effetti ecologici positivi della misura. Nel Parco naturale des Bauges i tempi non sono ancora maturi per un bilancio ecologico del genere.

Contatto

Parc naturel régional du Massif des Bauges, referente: Philippe Mestelan
http://www.parcdesbauges.com/agriculture/agri-environnement/ (fr)

Altre informazioni

Ministero dell’alimentazione e dello spazio rurale Baden-Württemberg, informazioni sul Programma “Artenreiches Grünland nach MEKA in Baden-Württemberg"
http://www.landwirtschaft-mlr.baden-wuerttemberg.de/servlet/PB/menu/1040915_l1/index1215700849246.html (de)

Rapporto completo di un viaggio di studio sul tema dei prati e pascoli ricchi di specie, organizzato dal Parco naturale des Bauges e dall’INRA di Avignone con molti dettagli sul programma del Baden-Württemberg e del Parco naturale Massif des Bauges
http://www.alparc.org/content/download/21418/199283/version/1/file/Rapport_voyage_MEKA_Juillet07.pdf (fr)

Oppermann R., Gujer H.U. (Editore) (2003): Artenreiches Grünland Bewerten und fördern - MEKA und ÖQV in der Praxis. Ulmer, 199 p.

Seminagione con grande varietà sul coltivato, regione di Würzburg, Germania

Nell'ambito del progetto pilota "Con i corridoi biologici nel paesaggio culturale", due Comuni della regione di Würzburg puntano a creare, nel giro di cinque anni, un complesso sistema di corridoi biologici. Si tratta al contempo di disinnescare i potenziali conflitti fra diversi utenti del territorio, fra cui gli agricoltori e i selvicoltori, i cacciatori, gli ambientalisti, i turisti e gli sportivi.

A questo scopo sono state sviluppate diverse miscele di semenze, ricche di specie selvatiche e coltivate, seminate prevalentemente su superfici arative dismesse. In fase di attuazione del progetto si punta ad utilizzare gli strumenti esistenti dello sviluppo strutturale agricolo, quali misure ambientali agricole, scambio e messa a riposo di superfici agricole, di combinarli con nuove misure e svilupparli. Per la gestione del progetto è stato istituito un team interdisciplinare composto da biologi, forestali e curatori del paesaggio. Sono stati coinvolti anche numerosi enti pubblici, fra cui l'ufficio agricoltura, l'ufficio forestale e l'associazione di tutela del paesaggio. Oltre a questi sono stati coinvolti anche agricoltori, cacciatori e rappresentanti dei Comuni.

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In una prima fase sono state esaminate le esigenze della popolazione nei confronti del paesaggio agricolo. A tal fine sono stati effettuati dei sondaggi da cui è risultato che la maggior parte della popolazione della regione auspica una maggiore diffusione dei bordi delle carreggiate con piante a seme, siepi e boschetti campestri, con specchi d'acqua e prati con radi alberi da frutto.

Sono state individuate le varie possibilità per tenere conto dei desideri della popolazione nella creazione di corridoi biologici. Si è potuto constatare che la creazione di strutture permanenti (siepi, boschetti campestri) sui terreni arabili prevalentemente buoni sarebbe stata difficile e possibile solo insieme a misure di compensazione e sostitutive. Pertanto, un aspetto importante dei corridoi biologici è stata la promozione di fanerogame sulle superfici arabili. A questo scopo le sementi ricche di specie selvatiche che nel corso del progetto sono state ulteriormente sviluppate e orientate in base alle esigenze di determinate specie animali, sono state sparse su superfici arative dimesse. Sono state sviluppate diverse miscele di sementi, fra cui una miscela di fiori recisi particolarmente adatta per le periferie dei centri abitati e le superfici incolte nei paesi veri e propri. Un criterio importante delle mescole di sementi era è l'assenza di problemi a livello agricolo e la possibilità di ricondurre le superfici in ogni momento al loro convenzionale processo di produzione. Oltre a ciò sono state utilizzate appositamente piante autoctone.

Bilancio

Per un gran numero di specie, le superfici di semina ricche di specie selvatiche offrono risorse alimentari e copertura in un paesaggio agricolo altrimenti poco ricco. L'importanza delle superfici seminative per la protezione delle specie ha potuto essere documentata con numerosi studi scientifici di accompagnamento su uccelli e invertebrati (carabidi, ragni, farfalle diurne). E' stata riscontrata anche la presenza di specie nidificanti nelle siepi (p. es. l'averla piccola [Lanius collurio]).

Oltre a questo, da un sondaggio promosso al termine del progetto risulta che le piante da fiore sono particolarmente apprezzate da agricoltori, cacciatori e dalla popolazione locale. Complessivamente nell'ambito del progetto è stato inverdito il 3,56% della superficie del Comune e quindi l'8% della superficie agricola produttiva. Il finanziamento di tali superfici può essere coperto attraverso le misure agro-ambientali. Un finanziamento innovativo è costituito da un contributo finanziario dei cacciatori e dei Comuni, anch'essi beneficiari della misura. Il progetto nel suo complesso ha messo in evidenza che proprio nel paesaggio intensamente sfruttato, le semine ricche di specie selvatiche rappresentano un'ottima opportunità per ricreare corridoi biologici attrattivi ed ecologicamente efficaci.

Le superfici di semina ricche di specie, p. es. programmi che interessano i bordi dei campi, sono parte integrante di numerosi programmi agro-ambientali. Attraverso il progetto "Con i corridoi biologici nel paesaggio culturale" è stato analizzato in dettaglio la creazione mirata di habitat su superfici dimesse nell'ambito della realizzazione di corridoi biologici. Risultati analoghi sono stati presentati nel progetto finanziato dal DBU "Habitat terreno a maggese" che si occupa della possibilità di gestire i terreni a riposo conformemente alle esigenze della fauna selvatica, sulla base degli strumenti per il controllo dei mercati agrari (messa a riposo delle terre) in Germania.

Contatto

Bayerische Landesanstalt für Weinbau und Gartenpflege (LWG), Abteilung Landespflege, referente: Martin Degenbeck
http://www.lwg.bayern.de/landespflege/landschaftspflege/25786/ (de)

Altre informazioni

Bayerische Landesanstalt für Weinbau und Gartenpflege, Abteilung Landespflege (2007): Con i corridoi biologici nel paesaggio culturale. Semine ricche di specie su superfici arabili come nuovo strumento principale della protezione della natura – Risultati di un progetto pilota nella regione di Würzburg.
http://www.lwg.bayern.de/landespflege/landschaftspflege/25786/ansaat_pilotpro.pdf (de)

Progetto "Habitat terreno a maggese" della Deutsche Wildtierstiftung, finanziato dalla Deutsche Bundesstiftung Umwelt (DBU). Rapporto finale "Chi semina diversità crea spazi di vita! - Dai monotoni terreni a maggese e a riposo verso pregiati habitat"
http://www.lebensraum-brache.de/_downloads/service/downloads/eigene/2007_Endbericht_Lebensraum_Brache.pdf (de)

Turismo e Tempo libero

“Esperienza nastro verde“ in Germania

Grazie alla sua ricchezza di specie e di spazi vitali in gran parte a rischio e alla sua particolare funzione ai fini dei corridoi biologici, il “Nastro verde” ha un particolare valore ai fini della protezione della natura. Lungo la ex striscia di confine fra le due Germanie, la natura ha potuto svilupparsi indisturbata per alcuni decenni. Per tutta la sua lunghezza, il “Nastro verde” collega territori pregiati e paesaggi agricoli soggetti ad un utilizzo intensivo, come p. es. i Börden (avvallamenti particolarmente fertili) e, per un gran numero di specie animali e vegetali sensibili ai disturbi e a rischio, rappresenta l’unica zona di rifugio rimasta.

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Per permettere la conservazione a lungo termine del “Nastro verde”, dal 2007 l’Ufficio Federale di Protezione della Natura finanzia un progetto dal titolo “Esperienza Nastro verde”. Esso mira a sensibilizzare la popolazione della regione e gli ospiti provenienti da fuori sull’importanza del “Nastro verde”. Nell’ambito del progetto i paesaggi lungo il “Nastro verde” con tutta la loro storia diverranno riconoscibili e fruibili per turismo e per scopi ricreativi. A questo scopo si realizzano misure concrete di conservazione e tutela del paesaggio insieme ad una segnaletica uniforme, l’istituzione di sentieri da percorrere a piedi e in bicicletta, la realizzazione di mostre e la predisposizione di offerte concrete a livello naturalistico e turistico.

Per la predisposizione di strategie di commercializzazione sono state delimitate tre regioni modello che si proporranno all’insegna di diverse tematiche principali. Un elemento importante è anche la storia della regione nella sua funzione di confine fra le due Germanie. Per ogni regione sono state sviluppate offerte turistiche idonee e coinvolti operatori del settore. Sono importanti anche il coinvolgimento dell’artigianato e l’approfondimento di altri aspetti storici e culturali della regione.

In ogni regione modello viene inoltre promossa la cooperazione a livello transfrontaliero. Questo approccio non si ferma ai confini amministrativi, ad esempio fra circondari rurali e Länder, ma supera anche i confini tematici come ad esempio fra gli attori dei settori protezione della natura, agricoltura, turismo o i responsabili dei luoghi di memoria storici. In questo modo si persegue un approccio integrativo che a lungo termine potrà dare un contributo importante ad uno sviluppo regionale compatibile con la natura.

I diversi attori nelle regioni modello vengono supportati da una consulenza scientifica professionale. In questo senso la valutazione generale del progetto è altrettanto importante dello sviluppo di un'immagine unitaria ed uniforme, la consulenza tecnica e scientifica e la commercializzazione centralizzata.

Bilancio

E' già stato sviluppato un gran numero di offerte con una commercializzazione congiunta in internet e sotto forma di brochure sotto il marchio comune "Esperienza Nastro verde".

Altre informazioni

Informazioni presso l'Ufficio Federale di protezione della Natura http://www.bfn.de/0311_gruenes_band.html (de)

Sito web "Esperienza nastro verde"
http://www.erlebnisgruenesband.de/ (de)

Alpinismo – Arrampicate compatibili con la natura, Germania

Molte rocce rappresentano zone di rifugio per specie rare e protette della fauna e della flora. Nelle zone umide e in ombra ai piedi della roccia crescono felci e muschi, mentre il sole rovente che batte sulla sommità della roccia richiede capacità di adattamento alla siccità e alle elevate escursioni termiche.

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Fra questi estremi, in uno spazio ristrettissimo trovano la propria nicchia molte piante diverse: sulle parti lisce della roccia crescono le felci, nei piccoli fori trovano il loro habitat diverse fanerogame, sulle cenge crescono cuscini a tappeto, mentre la zona della cima ospita le ericacee. Anche una fauna del tutto particolare trova il suo habitat nella roccia. Il falco pellegrino e il gufo reale appartengono a specie essenzialmente legate a biotopi rocciosi. Anche fra gli insetti vi sono specie molto specializzate e rare. I mammiferi legati alla roccia particolarmente a rischio comprendono alcune specie di pipistrelli che svernano in caverne e spesso hanno le loro dimore estive nei crepacci. Perché questi spazi naturali unici non siano danneggiati dagli alpinisti sono necessari e utili accordi per un'arrampicata in armonia con la natura.

Misure del Deutsche Alpenverein (DAV)

L'insieme delle misure del DAV per un alpinismo in armonia con la natura comprende l'elaborazione di proposte di arrampicata in collaborazione con le autorità e le associazioni ambientaliste. A questo riguardo il DAV punta a soluzioni le più differenziate possibili che stabiliscono a livello locale dove l'arrampicata è compatibile con la natura e dove invece è preferibile rinunciarvi al fine di proteggere la natura. Le vie di accesso e i tratti chiusi delle pareti vengono contrassegnati con una simbologia unitaria in uso in tutta la Germania. Nei periodi di cova delle specie avicole protette, quali il falco pellegrino, l'accesso alle pareti o parti di esse vengono temporaneamente chiusi.

Un elemento centrale di questa strategia sono gli operatori locali addetti alla roccia. Insieme ad altre associazioni alpinistiche della Germania (p. es. IG Klettern, Associazione degli Arrampicatori del Palatinato), il DAV ha creato una struttura per la gestione delle zone di arrampicata extralpine della Germania che, partendo dal massimo ente a livello federale e passando per i comitati dei Länder e regionali fino agli assistenti locali, garantiscono la continuità delle zone di arrampicata in una natura intatta. Gli "assistenti di roccia" locali coordinano azioni quali il risanamento compatibile con la natura dei tiri e delle vie, la predisposizione di vie di accesso o la partecipazione attiva all'osservazione del falco pellegrino.

Una segnaletica unitaria e standardizzata in tutta la Germania per le pareti rocciose facilita la comunicazione con gli sportivi. La vegetazione sulle rocce si presenta spesso come un mosaico variopinto; le superfici prive di vegetazione si alternano con superfici coperte da vegetazione. Per tenere conto di questa varietà, le zonazioni delle pareti su piccole superfici sono spesso parte integrante di piani di arrampicata. I simboli "croce e freccia" garantiscono chiarezza e segnano il confine fra zone rocciose abilitate e chiuse. Al contempo indicano la via di accesso ottimale nelle zone sensibili.

Oltre a questo è stato creato un sistema di informazione unico che attraverso un portale internet fornisce tutte le informazioni sulle pareti rocciose aperte agli arrampicatori in Germania (ricerca dettagliata della roccia, carte interattive, informazioni sullo spazio naturale della regione, novità nazionali e regionali, strumenti utili per gli "assistenti di roccia").

Bilancio

Grazie all'accordo contrattuale su base volontaria, le misure necessarie sono ampiamente accettate dagli arrampicatori. Accanto alla sua flessibilità, un altro vantaggio di questa soluzione è rappresentato dai minori costi dovuti ad una riduzione al minimo dell'intervento pubblico. Quando il controllo del successo conduce a nuove acquisizioni scientifiche, le regole concordate possono essere cambiate senza grossi impegni organizzativi e finanziari.

La strategia presentata è basata su accordi chiari con gli utenti (sportivi) e sulla collaborazione attiva del volontariato. Il lavoro di comunicazione che affianca la misura rappresenta inoltre uno strumento semplice ma efficace per aprire il dialogo con gli sportivi e per sensibilizzarli ai temi della natura nell'ambito delle loro attività di tempo libero.

Altre informazioni

Informazioni complete sulle soluzioni di arrampicata e sulle arrampicate compatibili con la natura nel portale:
http://www.dav-felsinfo.de (de)

Sci alpinismo compatibile con la natura, Parco nazionale Berchtesgaden, Germania

Negli ultimi anni le attività sportive quali escursioni con le racchette da neve e scialpinismo si sono ampiamente diffuse. Esse consentono di vivere il paesaggio invernale al di fuori dei sentieri e delle piste. In questo modo tuttavia gli sportivi penetrano nelle zone di rifugio della fauna selvatica che in inverno è molto sensibile al disturbo.

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Esempio del Parco nazionale di Berchtesgaden, Germania

Per gestire il flusso degli sportivi che praticano questa disciplina, nel Parco nazionale di Berchtesgaden l'amministrazione del parco, in accordo con le associazioni alpine, provvede a tagliare e ripulire sei tradizionali percorsi di sci-alpinismo nella zona boschiva. In questo modo si impedisce un allargamento territoriale, degli orari e quantitativa dello sci-alpinismo e – pubblicizzando i percorsi descritti nelle guide di sci-alpinismo – si punta a raggiungere una concentrazione territoriale per impedire l'accesso ai territori di riposo della fauna selvatica.

Oltre a ciò il progetto "Sci-alpinismo compatibile con l'ambiente" del Deutsche Alpenverein (DAV) viene implementato anche nella regione del Parco nazionale. Il progetto ha come obiettivo che lo sci-alpinismo venga praticato in maniera sostenibile e compatibile con la natura. I percorsi sono condotti in modo tale da non toccare habitat sensibili, come ad esempio i territori dei galliformi.

Per le aree critiche il DAV, ad esempio, ha preparato dei percorsi privilegiati per i praticanti dello scialpinismo, che vengono comunicati al pubblico tramite apposite segnaletiche (indicazione di aree sensibili, segnaletica dei percorsi, pannelli e cartine in corrispondenza dei parcheggi). Si punta anche alla cooperazione con autori ed editori di guide turistiche. L'azione comune coinvolge tutti gli enti e le associazioni interessati (uffici forestali, Landratsämter, soccorso alpino, Bund Naturschutz, Landesbund für Vogelschutz, Deutscher Skiverband, Associazione dei cacciatori, Associazione degli agricoltori della Baviera, Associazione per la tutela della montagna, Amici della natura, ecc.). Quest'iniziativa è

accompagnata anche da lavori scientifici sul tema “Disturbi arrecati alla fauna selvatica dai praticanti degli sport invernali”.

Bilancio

Soprattutto nell’area protetta, queste misure sono molto ben comprese ed accettate dagli sci-alpinisti. In diverse aree fra cui le catene montuose centrali della Germania, gli effetti positivi sono stati documentati soprattutto sulle popolazioni di tetraonidi.

Altre informazioni

Per informazioni sul progetto “Sci-alpinismo compatibile con l’ambiente” consultare il sito del Deutsche Alpenverein:
http://www.alpenverein.de/template_loader.php?tplpage_id=51 (de)

Informazioni sulle iniziative del Parco **nazionale** di Berchtesgaden http://www.nationalpark-berchtesgaden.bayern.de/01_nationalpark/01_aufgaben/09_management/06_skibergsteigen/index.htm (de)

Relazioni pubbliche

L'esempio dell'Associazione ambientalista francese FRAPNA: Il kit di giochi "Natura senza frontiere"

I bambini di oggi sono gli adulti – decisori ed attori - del domani. Per questa ragione è importante trasmettere loro in maniera semplice e ludica i rapporti ecologici e le principali funzioni dei sistemi naturali. E' questo lo scopo del kit di giochi didattici "Natura senza frontiere".

Tutti gli esseri viventi devono potersi muovere nel loro ambiente per trovare dei partner per la riproduzione, per alimentarsi, per raggiungere i propri quartieri stagionali e – in definitiva – per avere accesso alle risorse indispensabili per la sopravvivenza. Ma numerose barriere compromettono la mobilità di molte specie, costrette ad esempio, ad attraversare strade, recinti e binari. Queste barriere interrompono i collegamenti naturali esistenti fra i diversi habitat. Ma vi sono diverse possibilità per superare queste barriere.

Questo kit di giochi permette a bambini e giovani di conoscere le esigenze di spostamento di alcune specie esemplari, di riconoscere le possibili barriere ed individuare soluzioni semplici per il superamento di tali barriere. Questi giochi accessibili a chiunque si prestano sia per l'uso in aula che all'aperto.

Il kit comprende una guida teorica con spiegazioni della problematica, alcune proposte di azione e soluzioni possibili (80 pagine), un quaderno delle attività con istruzioni per le osservazioni, 12 esperimenti e diverse attività (60 pagine) nonché diversi giochi (carte, giochi da tavola, modelli di identificazione, sagome di uccelli). In internet viene inoltre offerto un gioco interattivo per i bambini.

Questo kit di giochi è stato sviluppato nel periodo 2005-2008 nell'ambito di una campagna di sensibilizzazione ambientale sul tema dei corridoi ecologici. Parallelamente a quest'iniziativa è stato costituito un club di bambini (Natura senza frontiere) a cui le classi e i gruppi possono segnalare le proprie osservazioni ed esperienze. Ad intervalli regolari (3 volte all'anno) il Club di bambini pubblica una propria rivista. Una pagina internet fornisce informazioni aggiornate e riporta notizie relative alla campagna.

Altre informazioni

Homepage della campagna di sensibilizzazione ambientale:
http://www.frapna-haute-savoie.org/ (fr)

"Via libera per corridoi ecologici", confine franco-svizzero del bacino del Lago di Lemano

Il sentiero didattico “Via libera ai corridoi ecologici“ è stato sviluppato dalle tre organizzazioni ambientaliste Pro Natura Ginevra, Appollon 74 e FRAPNA in Alta Savoia nell’ambito di un progetto transfrontaliero Interreg IIIA. Dalle rive dell’Arve in Svizzera conduce all’altipiano del Salève. Lungo il percorso sono applicati diversi pannelli con spiegazioni sull’importanza dei corridoi ecologici. Questi pannelli sono stati realizzati insieme ad alcune scuole delle regione. Nell’ambito di questa collaborazione insegnanti e studenti si sono occupati intensamente del tema della messa in rete degli habitat. Complessivamente al progetto hanno partecipato 20 classi.

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Il percorso didattico si concentra su due temi principali: da un lato si tratta di ribadire l’importanza della protezione degli habitat esistenti, e dall’altro di presentare le possibilità di ridurre la frammentazione del paesaggio e quindi di favorire la mobilità della fauna. Nell’ambito del progetto sono stati creati altri strumenti di formazione quali una brochure e una mostra itinerante.

Parallelamente a quest’azione è stata condotta una campagna di informazione orientata specificatamente ai responsabili dell’assetto territoriale ed alle amministrazioni comunali. Per questi è stato predisposto un manuale con ausili per la decisione e si sono organizzati eventi informativi. Uno dei principali obiettivi di queste manifestazioni è stata la presentazione della multifunzionalità di corridoi che accanto all’importanza ecologica hanno anche una funzione sociale (spazi dedicati al tempo libero, ricreazione) ed economica (p. es. la gestione sostenibile delle fasce verdi lungo le strade).

Bilancio

Questa misura non avrà effetti ecologici diretti. La buona collaborazione e il forte interesse delle numerose classi che hanno partecipato al progetto, insieme agli eventi diurni e serali con numerose presenze per i decisori a livello di comuni e amministrazioni, documentano però il grande interesse della misura e rendono probabile anche un effetto ecologico positivo indiretto.

Contatti

Referenti presso la FRAPNA Haute-Savoie: Damien Hiribarrondo
http://www.frapna-haute-savoie.org/ (fr)

Altre informazioni

La brochure del progetto ed altri dettagli possono essere visionati sotto
http://www.pronatura.ch/ge/index.php?lang=3&mz=5 (fr)

"Running Wild – Corsa per il gatto selvatico", Germania

Nel settembre 2006 il BUND Germania in cooperazione con l'Associazione sportiva della Turingia ha per la prima volta organizzato la gara podistica "Running Wild – Corsa per il gatto selvatico". Questa competizione punta a segnalare la necessità di mettere in rete i boschi di Turingia, Baviera ed Assia per permettere ai gatti selvatici la fruizione di grandi territori connessi fra di loro. Nell'ambito di "Running Wild" è stato comunicato al pubblico il corridoio di migrazione per gatti selvatici la cui istituzione è prevista fra il Parco naturale di Hainich e la Foresta della Turingia.

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La gara podistica è stata organizzata con la collaborazione di diversi attori della regione, fra cui sportivi, ambientalisti e naturalisti, autorità e imprenditori. Una famosa atleta locale ha prestato la sua immagine.

La gara dedicata al gatto selvatico è parte integrante di un progetto del BUND Germania, la "Rete di salvataggio dei gatti selvatici". Questo ha come obiettivo di predisporre in tutta la Germania circa 20.000 km di corridoi di migrazione per specie legate ai boschi quali il gatto selvatico, ma anche il tasso o la martora. Gli ambientalisti e i volontari hanno creato un piano dei percorsi dei gatti selvatici che in futuro dovrà supportare una pianificazione compatibile delle vie di comunicazione, ma anche delle zone residenziali e industriali.

Le ricerche effettuate nell'ambito del progetto hanno permesso di accertare che alcune piccole popolazioni di gatti selvatici vivono in territori separati l'uno dall'altro. Inoltre è stata effettuata una prima completa analisi degli ostacoli alla loro diffusione. In futuro i territori fortemente frammentati dovranno essere meglio collegati fra di loro per assicurare la presenza del gatto selvatico a lungo termine. A tal fine si punta a creare collegamenti con cespugli ed alberi con circa 50 metri di larghezza e una lunghezza totale di 20 km, che permettano la diffusione del gatto selvatico dal Parco nazionale di Hainich verso la Foresta

della Turingia. A lungo termine seguiranno altri corridoi che collegheranno aree forestali di Turingia, Baviera, Assia, Bassa Sassonia e Baden-Württemberg.

La gara podistica dedicata al gatto selvatico è un importante aspetto di questo progetto. Questa gara supporta il lavoro di comunicazione ed è stata usata come strumento per presentare il corridoio previsto, per informare la popolazione sul gatto selvatico e le sue esigenze e per mettere in evidenza la sua importanza. Le principali gare sulle varie distanze sono state accompagnate da un programma di contorno molto vario. In questo modo è stata rafforzata la sensibilità per la biodiversità e l'importanza di collegamenti ecologici nel paesaggio.

Bilancio

Al primo Running Wild nel settembre 2006 in Turingia hanno partecipato 250 podisti e circa 2000 visitatori. Visto il grande successo della manifestazione, nel 2008 si sono tenute altre due gare podistiche dedicate al gatto selvatico, una in Turingia ed una in Assia.

La gara organizzata dal BUND Waldeck Frankenberg, dalla catena del Rothaar in direzione del Burgwald-Kellerwald, per presentare al pubblico il previsto corridoio di collegamento fra i due territori, ha vinto il Premio ambiente MUNA della Deutschen Bundesstiftung Umwelt (DBU) nella categoria comunicazione ambientale. L'intero progetto per la creazione di corridoi biologici contribuisce alla protezione delle specie e della natura e la gara podistica dedicata al gatto selvatico funge da eccellente strumento di comunicazione per sensibilizzare l'opinione pubblica sulla problematica della frammentazione del paesaggio. Allo stesso tempo permette di trasmettere informazioni complete ed acquisire mezzi finanziari aggiuntivi finalizzati alla tutela del gatto selvatico. Il BUND Turingia propone inoltre la "adozione" del gatto selvatico, un'operazione che consente alle persone interessate di sostenere la "Rete di salvaguardia del gatto selvatico" in Turingia.

Altre informazioni

"Running Wild – la corsa per la vita del gatto selvatico"
http://wildkatzet3.bund.net/index.php?id=79 (de)

Gestione dell'acqua

Progetto LIFE Paesaggio torrentizio Tiroler Lech, Austria

I corsi d'acqua sono elementi essenziali della rete ecologica. Dalla sorgente alla foce i corsi d'acqua costituiscono elementi lineari di connessione, rappresentando insieme agli ecosistemi di accompagnamento importanti corridoi di migrazione e di propagazione per numerose specie della fauna e della flora.

Spesso non sono in grado di soddisfare interamente queste funzioni naturali in quanto fortemente ridotti a livello territoriale e anche nella loro dinamica. Ciò vale anche per molti fiumi nell'arco alpino. I corsi d'acqua sono al contempo soggetti ideali a favorire la cooperazione transfrontaliera, perché spesso in tutto il loro corso attraversano diversi Paesi e formano confini naturali lungo i quali si estendono anche i confini degli Stati. Oltre a ciò, le misure in corrispondenza dei corsi d'acqua contribuiscono anche all'attuazione della Direttiva Acqua europea, in quanto il ripristino della permeabilità dei corsi d'acqua è elemento integrale della Direttiva e quindi un obbligo degli Stati membro.

© Andreas Zischg

Le misure in corrispondenza dei corsi d'acqua, in particolare per la rivitalizzazione, sono spesso molto complesse perché coinvolgono un gran numero di attori diversi con interessi di uso molto differenti. Le relative misure sono per di più molto costose.

Nel periodo 2001-2006, nell'area Natura 2000 Tiroler Lechtal è stato attuato il progetto LIFE Tiroler Lech che prevedeva misure per la protezione strutturale dalle piene, di rivitalizzazione e di protezione della natura. Gli obiettivi del progetto prevedevano fra l'altro la conservazione e il ripristino degli habitat fluviali seminaturali e dinamici, insieme al miglioramento della difesa dalle piene. Inoltre puntava a favorire determinate specie animali e vegetali a rischio e sensibili ai disturbi, e a sensibilizzare la popolazione sui temi della protezione della natura. In questo ambito si trattava anche di mettere insieme il numero maggiore possibile di organizzazioni con gli interessi più svariati.

Complessivamente nell'ambito del progetto sono state attuate numerose misure singole. Le principali di queste comprendono:

Allargamenti dell'alveo, in cui la decostruzione di interventi correttivi ha consentito di ripristinare un habitat fluviale seminaturale.

L'apertura delle briglie di trattenuta del materiale in corrispondenza degli affluenti doveva contribuire a migliorare il bilancio del trasporto solido e provocare in questo modo un innalzamento del fondo dell'alveo. In tal modo si doveva impedire l'ulteriore abbassamento dell'alveo e della falda acquifera.

Nell'ambito di diverse misure minori sono stati rivitalizzati degli affluenti del Lech ricollegandoli al fiume principale.

Per alcune specie target del progetto sono stati eseguiti dei progetti di protezione della specie e di reintroduzione. Le specie target comprendono: [Coenagrion hylas], tamerice alpina [Myricaria germanica], scarpetta di venere [Cypripedium calceolus], corriere piccolo [(Charadrius dubius], e lo scazzone.

L'istituzione di piattaforme di osservazione e sentieri quali ad esempio torri di avvistamento come parte integrante del sentiero ornitologico, doveva fornire impulsi positivi per un turismo in armonia con la natura. Al contempo alcuni elementi di controllo proteggono le specie target del progetto, quale la scarpetta di Venere.

Un centro informazioni funge da punto di partenza per le escursioni e gli eventi volti alla sensibilizzazione. Qui vengono anche fornite informazioni sul progetto e sull'habitat Lech.

Bilancio

Il progetto LIFE ha dato lo spunto per un gran numero di cooperazioni di diversi partner su temi quali la difesa dalle alluvioni, la rivitalizzazione e il turismo. Nel 2005 è stato creato il Parco naturale Tiroler Lech. Il progetto INTERREG "Messa in rete dei habitat lungo i corsi d'acqua sull'esempio del Lech" ha preso come modello il progetto LIFE. Basandosi sulle strutture esistenti sono state attuate misure ulteriori mirate ai corridoi biologici, fra cui l'elaborazione di un piano di protezione per le specie avicole che nidificano nella ghiaia del Halblech, e un ampio lavoro di comunicazione con al centro l'importanza degli elementi paesaggistici di connessione. Fra questi va evidenziata in particolare l'azione "Zattera sul Lech 2005". Nel progetto INTERREG sono state elaborate anche proposte di azione per altri corsi d'acqua transfrontalieri che sarebbero trasferibili ad altri progetti simili.

Altre informazioni

Informazioni sul progetto LIFE Tiroler Lech sotto
http://www.tiroler-lech.at (de)

Informazioni sul progetto INTERREG IIIB messa in rete degli habitat, sottoprogetto corsi d'acqua
http://www.lsn.tirol.gv.at/de/index.htm (de, en, it)
http://www.lsn.tirol.gv.at/de/doc/fliessgewaesser.pdf (de),
http://www.lsn.tirol.gv.at/it/doc/fliessgewaesser_it.pdf (it)

Trasporto

Gestione ottimizzata degli sfalci ai margini delle carreggiate, Isère, Francia

Uno sfalcio ritardato permette alle piante di fiorire, fruttificare e maturare i semi. In questo modo possono offrire cibo e riparo ad insetti ed altri piccoli animali. La qualità di spazi vitali quali strisce verdi e margini delle carreggiate dipende da un gran numero di fattori diversi. Lo sfalcio è uno dei fattori più facili da influenzare. Spostando il taglio delle strisce verdi alla tarda estate oppure applicando tecniche di sfalcio a mosaico che prevedono il taglio di piccole superfici per volta, le condizioni di habitat delle farfalle diurne ma anche di molte altre specie possono migliorare.

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Esempio del Dipartimento francese dell'Isère

Nel Dipartimento dell'Isère, il centro di manutenzione delle strade e il Consiglio Generale del Dipartimento in cooperazione con l'associazione ambientalista GENTIANA, a partire dal 2004 stanno attuando un progetto dal nome di "Sfalcio ragionato, natura protetta" riguardante i bordi stradali e le strisce verdi della rete stradale del Dipartimento. Rinunciando all'uso di pesticidi e adottando uno sfalcio meglio pianificato si punta a proteggere la biodiversità. La varietà di fauna e flora ai bordi stradali del Dipartimento è stata in precedenza rilevata nell'ambito di una ricerca complessa promossa da GENTIANA. La gestione dello sfalcio segue il motto: "sfalciare il necessario, ma il meno possibile". A questo riguardo si punta soprattutto alla sicurezza stradale. Lo sfalcio tuttavia non avviene prima che la maggior parte dei fiori sia sfiorita e abbia prodotto il seme.

Bilancio

Cartelli posti in corrispondenza di punti strategici ed ecologicamente significativi della rete stradale segnalano quest'azione ed informano il pubblico. Gli effetti positivi sulla fauna e flora sono già stati documentati. Oltre a ciò, una migliore pianificazione dei tempi di intervento e dell'uso di materiale e un minore carico di lavoro hanno permesso di ridurre i costi.

Altre informazioni

Le informazioni sullo "Sfalcio ragionato" con schede tecniche ed esempi possono essere consultate sulla homepage dell'Associazione Gentiana
http://www.gentiana.org/site:gestion (fr)

Varie ed Eventuali

Diagnostica dell'inquinamento luminoso, Isère, Francia

Il termine inquinamento luminoso indica lo schiarimento del cielo notturno dovuto a fonti di luce artificiali la cui luce viene diffusa nell'atmosfera. Questo fenomeno può produrre vari effetti: l'ambiente schiarito artificialmente influisce ad esempio sul ciclo vegetativo delle piante; le diffuse fonti luminose bianche con un'alta percentuale di azzurro nello spettro possono rivelarsi un notevole problema per la navigazione e l'orientamento di insetti attivi di notte e anche per gli uccelli migratori.

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Negli animali notturni gli organi sensoriali sono specificatamente adattati alle condizioni notturne e quindi molto sensibili nei confronti della luce artificiale. Questo spiega l'alta frequenza di incidenti notturni con il coinvolgimento della fauna selvatica. Per questa ragione gli animali tentano di evitare le fonti luminose; una strada illuminata può pertanto rappresentare un'importante barriera e contribuire alla frammentazione dell'habitat.

Come risulta da alcune cifre, negli ultimi anni le fonti luminose artificiali sono sensibilmente aumentate. Nelle Alpi svizzere la superficie illuminata è raddoppiata nel periodo 1992 – 2000 e parallelamente a ciò è aumentata anche l'intensità dell'illuminazione. Negli ultimi 10 anni, in Francia il numero di fonti luminose è cresciuta del 30% e – nei Comuni con meno di 5000 abitanti - la durata dell'illuminazione è raddoppiata.

Esempio del Dipartimento dell'Isère, Francia

Gran parte dell'inquinamento luminoso deriva semplicemente da fonti luminose mal costruite o installate in maniera non efficace ed è evitabile – p. es. in relazione alla sicurezza stradale - senza conseguenze negative.

L'amministrazione del Dipartimento Isère sostiene i Comuni che effettuano una diagnosi della loro illuminazione pubblica. A questo scopo viene messo a disposizione un capitolato ai fini di garantire la qualità dell'analisi. Dal 2004 sono state effettuate circa 12 diagnosi del genere. I costi di queste misure ammontano a 2.000 – 10.000€, a seconda delle dimensioni del Comune, del numero di fonti luminose e della disponibilità di dati. Sono previsti contributi pubblici che possono coprire fino all'80% della somma. Secondo alcune stime, tramite investimenti mirati, i Comuni possono ridurre del 20 – 40% i loro costi energetici.

Nel corso di uno studio del genere viene fra l'altro analizzato il numero e il tipo di illuminazione pubblica, i punti luce più grandi vengono cartografati e vengono individuate soluzioni per i punti problematici (p. es. illuminazione di monumenti, piste da sci, discoteche, patrimonio architettonico).

Bilancio

Accanto agli effetti positivi per la fauna notturna, risultano anche effetti positivi per la salute umana e una riduzione dei costi grazie ad un'illuminazione ottimizzata e l'eliminazione delle fonti luminose inutili.

Contatti e ulteriori informazioni

Referente: ADEME (Ufficio dell'ambiente e della gestione dell'energia)
http://www2.ademe.fr (fr, en)

L'organizzazione Dark Sky fornisce informazioni dettagliate sul tema dell'inquinamento luminoso.
http://www.darksky.org (en)

Visualizzazione degli elettrodotti e configurazione dei tralicci

Centinaia di uccelli muoiono ogni anno a seguito di scosse elettriche o collisioni con elettrodotti. Oltre a ciò i grandi elettrodotti aerei tagliano i paesaggi aperti e riducono in questo modo il numero di superfici aperte utilizzate dall'avifauna nella sua migrazione.

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Gli incidenti di questo tipo possono essere evitati o perlomeno ridotti con una buona cooperazione fra associazioni ornitologiche e di protezione della natura e i gestori degli elettrodotti.

Per un'analisi della situazione regionale occorre documentare, mettere insieme ed analizzare i ritrovamenti di uccelli morti. Sulla base di questi risultati sono possibili le seguenti misure:

In zone di particolare rischio, l'interramento degli elettrodotti.

Lo smantellamento di tralicci particolarmente pericolosi (p. es. modelli aperti in alto che possono diventare una trappola per l'avifauna che nidifica nelle cavità).

Posa prevalentemente interrata delle nuove linee da 20.000 Volt oppure – se ciò non fosse possibile – l'adozione di misure protettive idonee.

Considerazione dei biotopi in fase di pianificazione e attuazione delle operazioni di taglio o disboscamento dei tracciati per gli elettrodotti aerei (periodi di nidificazione ecc.).

Una strutturazione dei tracciati più sensata e in armonia con la natura possibile.

La marcatura visiva di elettrodotti particolarmente pericolosi (p. es. con palloni di segnalazione).

Altre informazioni

Consiglio d'Europa/Conseil de l'Europe (2006): Lignes à haute tension - comment protéger les oiseaux/Protecting birds from powerlines Sauvegarde de la nature/Nature and environment n°140. Strasbourg, 76 p.
http://book.coe.int/FR/ficheouvrage.php?PAGEID=36&lang=FR&produit_aliasid=1827 (fr),
http://book.coe.int/EN/ficheouvrage.php?PAGEID=36&lang=EN&produit_aliasid=1827 (en)