

Appendix 3. The classification of habitats, land-uses and threats at Important Bird Areas in Europe.**HABITATS**

This classification is based on *A classification of Palearctic habitats* (Devillers and Devillers-Terschuren 1996), and is thus compatible with the habitat classification used by the CORINE Biotopes Programme (*Habitats of the European Community*, Devillers *et al.* 1991), which is the basis for EC legislation such as the Habitats Directive and also for other Europe-wide habitat-conservation initiatives.

The habitat-types in this classification are, in general, mutually exclusive. In some cases, the total percentage of all habitats at a site exceeds 100%, given that the distribution of habitats at individual IBAs is not always well known, and that estimates of habitat cover may be approximate and are sometimes derived independently of other habitats at the same site.

Forest and woodland

This category includes wooded grasslands and wooded scrublands (listed at primary level—'Forest and woodland'—only).

Broadleaved deciduous forest

Forests and woodlands of native deciduous trees, other than flood-plain or mire woods, in the boreal, nemoral (hemi-boreal; the transition zone between the boreal and temperate zones), continental steppe, warm-temperate humid and Mediterranean zones. Forests that are dominated by broadleaved deciduous trees, but include broadleaved evergreen trees, are included in this category.

Native coniferous forest

Forests and woodlands of native coniferous trees, other than flood-plain and mire woods, in the boreal, nemoral, continental steppe, warm-temperate humid and Mediterranean zones. Forests that are dominated by coniferous trees, but include broadleaved evergreen trees, are included in this category.

Mixed forest

Forests and woodlands of broadleaved deciduous and coniferous trees, in equal dominance, in the boreal, nemoral, continental steppe, warm-temperate humid and Mediterranean zones. Included here are plant communities of combined deciduous-tree and conifer dominance in which both constituents play a substantial part and that are related to primarily deciduous forests. Mixed coniferous and broadleaved evergreen forest is not included in this category, and should be listed under 'Native coniferous forest' or 'Broadleaved evergreen forest', depending on dominance.

Alluvial/very wet forest

Tree and shrub vegetation of riverine and lacustrine flood-plains, marshes, fens and bogs in the boreal, nemoral, continental steppe, warm-temperate humid, Mediterranean and subtropical desert zones.

Broadleaved evergreen forest

Forests and woodlands dominated by broadleaved evergreen trees (sclerophyllous, i.e. hard-leaved), or by palms. They are characteristic of the Mediterranean and warm-temperate humid zones, with a few representatives in the nemoral, continental steppe and transition to subtropical desert zones.

Wooded steppe

Formations of the transition zones between temperate/boreal forest and continental steppes, occurring in mid-latitudes south of, and inland from, the boreal and nemoral forest belts, in regions of reduced summer humidity, as well as in areas adjacent to, or under the influence of the Mediterranean and warm-temperate humid zones, represented by a macro-mosaic of steppe and connected, contiguous, disjunct or widely spaced woodland stands, the latter usually with a very developed grassy understorey, or by a scattering of trees within a steppe environment. The forest elements are often located on porous or slightly raised ground, valley sides or slopes, the grasslands occupying less well-drained soils and lower places.

Wooded tundra

Formations of the transition zone between boreal forest (taiga) and tundra, characterized by a scattering of stunted coniferous trees or deciduous shrubs within a tundra environment, or by a macro-mosaic of tundra with scattered islands of forest, or by open forest with scattered treeless tundra patches. These formations occur in a broad belt, up to several hundred kilometres wide, across the north of the northern continents and as a narrow belt in high-latitude mountains.

Treeline ecotone

Also called the timberline, krummholz zone, etc., this category comprises formations at the transition zone between montane forest and the alpine zone of mountains, where subalpine forests give way to alpine or boreal heaths and shrubs, and to alpine grasslands. They are characterized by a scattering of stunted, gnarled trees, punctuating an alpine shrub or grassland environment, by a macro-mosaic of alpine shrub and grass formations with scattered islands of forests, or by open or clear forest with an undergrowth composed of alpine elements such as ericaceous shrubs. The trees/shrubs occupy a narrow belt, varying in altitudinal location according to latitude, exposure and other climatic or edaphic conditions.

Wooded desert/semi-desert

Scattered trees/shrubs in the subtropical desert zones, resulting from the colonization by tropical woodland trees of shrubby or grassy semi-desert plant communities. Included in this category are desert savannas, pseudo-steppes and sand-dune open woodlands.

Scrub*Scrub*

Shrub communities of boreal, nemoral or steppic affinities, such as high-montane and boreo-montane conifer scrubs, and subalpine and Mediterranean-mountain bush communities, as well as recolonization communities of deciduous forest and temperate conifer forest (including formations maintained artificially, e.g. coppicing). Xerophytic scrub is treated as 'Wooded desert/semi-desert'.

Heathland

Low vegetation dominated by dwarf-shrubs, where succession to forest is inhibited naturally by harsh climate or artificially by fire, grazing and turf-cutting. Such formations include coastal or oceanic heaths and moors (e.g. in Atlantic, Macaronesian or oro-Mediterranean zones), high-montane and boreo-montane heaths in alpine and Arctic zones, and continental tragacanthic (spiny dwarf-shrub) communities.

Sclerophyllous scrub/maquis/garrigue

Evergreen sclerophyllous (hard-leaved) or lauriphyllous shrub communities of Mediterranean or warm-temperate humid regions and their areas of influence, occurring mostly as recolonization and degradation stages of broadleaved evergreen forests (maintained through grazing and burning), but irradiating into deciduous forest, steppe and desert areas. This category includes garrigue (phrygana; batha): cushion-forming thermo-Mediterranean sclerophyllous formations, often thorny and summer-deciduous, lower and more open than other formations.

[Savanna/bushland]

Although this primary habitat-type was listed as an option in the habitat classification used in the IBA data-sheet and in the IBA database, it does not occur in Europe according to the habitat definition in Devillers and Devillers-Terschuren (1996), therefore the few registrations of this habitat-type that were encountered (on submitted data-sheets/database) were amended to a more suitable habitat at the data-checking stage.

Grassland*Steppe/dry calcareous grassland*

Primary and secondary steppes, formations dominated by medium or tall perennial tuft-forming grasses or woody-stemmed herbs, with patchy

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ground cover, together with their associated annual or ephemeral communities. Typical formations, with two seasons of dormancy (winter and summer) that are in a large part climactic, are characteristic of a steppe belt in continental mid-latitudes, with irradiations in the deciduous forest zones. Structurally similar formations, although perhaps largely man-made (secondary), and mostly with a single season of dormancy (summer), are widespread in the transition zones that form on the temperate side of the subtropical deserts. By extension, this category also includes dry grasslands, mostly grazing-maintained, and forest-fringe formations of the lowland, hill and montane altitudinal levels of deciduous and broadleaved evergreen temperate forest zones, on mostly calcareous soils, sands and decomposed rock surfaces.

In this publication, abandoned arable land in areas of primary or secondary steppe (i.e. regenerating steppe land) has been included under this category, while fallow arable land in such areas—so called ‘pseudosteppe’—has been treated as ‘Arable land’. Mountain steppe (e.g. in Armenia) and shrub-steppe (e.g. paramó in Spain) have also been included in this category.

Dry siliceous grassland

Short, mostly secondary (grazing-maintained), grasslands and annual or ephemeral communities colonizing acidic, well-drained soils of the lowland, hill and montane levels of temperate deciduous, conifer and broadleaved forest zones.

Alpine/subalpine/boreal grassland

Primary and secondary grass- or sedge-dominated formations of the alpine and subalpine levels of the boreal, nemoral, warm-temperate humid and steppic mountains, and of the higher levels of Mediterranean mountains.

Humid grassland

Unimproved or lightly improved wet meadows and tall herb communities of the boreal, nemoral, warm-temperate humid, continental steppe and Mediterranean zones. The water-table remains high for much of the year.

Mesophile grassland

Lowland and montane mesophile (i.e. not drought-adapted) permanent pastures and hay meadows of the boreal, nemoral, warm-temperate humid, continental steppe and Mediterranean zones.

Tundra

Low plant communities of grasses and shrubs developed over permafrost. Plant cover becomes increasingly moss-dominated, patchy and sparse towards the north, grading into polar desert in the most extreme (unglaciated) parts of the Arctic regions, this being characterized by mostly bare ground worked by solifluction (frost-heave) and colonized by algae and very species-poor, extremely open plant communities constituted by lichens, mosses, liverworts and a very restricted number of vascular plants. Tundra-like plant communities in boreal montane areas, away from the main permafrost areas (e.g. along the mountain spine of Norway and in the Ural mountains of Russia), are sometimes composed of the same plant species as tundra, but in this publication have generally been classified as ‘boreal grassland’ under the category ‘Alpine/subalpine/boreal grassland’.

Machair

This is a distinctive, low sand-dune formation that is found nowhere else in the world but the north and west of Scotland and western Ireland. Machair is formed by a particular combination of physical factors, including climate and landform. Sand with a high shell content is blown onshore by the westerly winds that prevail in these areas, onto a low-lying coastal plain. Vegetation develops that is typical of calcareous to neutral sandy grassland. Traditionally, machair supports extensive grazing regimes and unique forms of cultivation that rely on low-intensity systems of rotational cropping.

Desert*Desert*

Interior continental deserts of temperate areas lying beyond the reach

of moisture-laden winds; rain-shadow deserts lying on the leeward side of high mountain ranges which intercept the rain-bearing winds; deserts situated within the Horse latitudes (subtropical belts of high atmospheric pressure); deserts of the west coast of continents, under the influence of cold ocean currents, almost without measurable rainfall but with high relative humidity in the form of fogs and mists.

Semi-desert

The transition zone between deserts (continental/subtropical/cool-coastal) and steppes or Mediterranean habitats or other formations, characterized by sparse xerophytic/halophytic shrub or dwarf-shrub communities, and/or xerophytic/ halophytic grasslands, etc.

Wetland*Tidal river/enclosed tidal water*

A zone of broadening in rivers entering the oceans or their connected seas, and river channels, below the tidal limit. Included are all marine and marine-related pelagic and benthic plant communities, and all river-course and river-bed plant communities.

Mudflat/sandflat

Sands and muds of the coasts of the oceans, and their connected seas and associated lagoons, submerged for part of every tide or for part of the annual cycle, devoid of vascular plants, but usually coated by blue algae and diatoms. They are of particular importance as feeding grounds for wildfowl and waders.

Saltmarsh

Communities of flowering plants, for the most part halophytes (salt-tolerant), colonizing sites submerged by high tides at some stage of the annual tidal cycle of oceans and their connected seas. This category also includes similar halophyte communities colonizing inland, permanent or temporary, saline, hypersaline or brackish water-bodies and their periphery, including inland closed seas, lakes, pools, sebkhas, rivers, springs and seeps, as well as, by extension, azonal, strongly differentiated communities developing on habitually dry, alkali, chlorid or gypseous soils of the steppe or forest zones (e.g. salt-steppes, salt-scrubs, salt-forests). Zonal communities of the desert and semi-desert areas, composed, to varying degrees, of halophytes or gypsophytes, are listed under ‘Desert’ or ‘Semi-desert’.

Sand-dunes/sand beach

Sand-covered shorelines of the oceans, their connected seas and associated coastal lagoons, fashioned by the action of wind or waves. Sand-bars and -banks on rivers should be classified under ‘River/stream’, and inland sand-dunes form their own category under ‘Rocky areas’.

Shingle/stony beach

Beaches of the oceans, of their connected seas and their associated coastal lagoons, covered by pebbles, or sometimes boulders, usually formed by wave action.

Coastal lagoon

Saline or hypersaline waters of the vicinity of the oceans and their connected seas, often formed from sea inlets by silting and cut off from the sea by more or less effective obstacles such as sand- or mud-banks.

Standing fresh water

Lakes, ponds and pools of natural origin containing fresh (i.e. non-saline) water, as well as semi-natural aquatic plant communities occupying man-made freshwater bodies, including artificially created lakes, reservoirs and canals.

Standing brackish and salt water

Non-marine brackish, saline or hypersaline lakes, pools and ditches, their features, their associated pelagic and benthic communities, and their beds of macrophytic submerged or offshore vegetation. Included in this category are large inland ‘seas’, such as the Caspian Sea, although in this publication open areas of the Caspian have been (mistakenly but consistently) classified under ‘Marine areas’.

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All rivers and streams (running water), permanent or temporary, fresh or saline. In this publication, related bars and banks of mud, sand, gravel and rock have been included under this category.

Raised bog

Highly oligotrophic (nutrient-poor), strongly acidic plant communities composed mainly of sphagnum moss growing on (and forming) peat, and deriving moisture and nutrients only from rainfall (ombrotrophic). They form only in relatively cool climates with heavy rainfall. They are most widespread in the boreal zone and in the mountains and hills of the nemoral zone; they occur locally in the lowlands of the nemoral zone and rarely in the continental steppe zones. In this publication, aapa and palsa mires have been listed under this category.

Blanket bog

Plant communities similar to raised bogs, on flat or gentle sloping ground with poor surface drainage, in oceanic climates with heavy rainfall (north-west Europe only, including Norway).

Water-fringe vegetation

Reedbeds and large-sedge plant communities of the margins and floating rafts of lakes, rivers and brooks, and of fens and eutrophic (nutrient-rich) marshes.

Fen/transition mire/spring

Small-sedge and related plant communities of fens, transition mires and quaking bogs; vegetation of springs.

Marine areas*Open sea*

Oceanic and continental-shelf waters of the world ocean and its connected seas, their associated open-water and bottom plant communities, and marine vascular vegetation beds; marine plant communities of the littoral zone and coastal lagoons.

Sea inlet/coastal features

Bays and narrow channels of the oceans and their connected seas, including sea lochs or loughs, fiords or fiards, rias and straits but excluding estuaries and lagoons.

Rocky areas

In this publication, some habitat-types have been listed under this primary category as there were no more suitable categories, including: 'eternal snow and ice' (high-mountain or high-latitude zones occupied by glaciers or by perennial snow); large, unvegetated expanses of outwash gravel (Iceland), mine-tailings (Russia), lava fields (Canary Islands/Spain).

Sea cliff/rocky shore

Rock exposures (including faces, ledges, caves and shore) adjacent to the oceans, their connected seas and associated coastal lagoons, or separated from them by a narrow shoreline.

In general, the listing of any habitat comprising less than 5% of the individual IBA area was discouraged during this inventory. Although this particular habitat-type usually comprised less than 5% of an IBA's area, it was often ornithologically important, therefore an effort was made to list this habitat whenever it was known to occur and/or be important, even if it comprised less than 5% of an IBA's area.

Rock stacks/islets

Permanently emerging, periodically uncovered, surface-breaking or near-surface raised features of the oceans, their connected seas and coastal waters, with their associated marine and terrestrial communities. Includes reefs, banks and shoals.

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Scree/boulders

Vegetated or sparsely vegetated and frequently unstable areas of stones, boulders or rubble on steep slopes, produced by erosion in mountainous terrain. They are characteristic of high mountains in all zones, extending to lower altitudes in the boreal and Mediterranean zones; a very few communities form in lowland areas elsewhere.

Inland cliff

Exposed rock of cliffs, rock-faces, limestone pavements, the plant communities that colonize their cracks, and their associated animal communities.

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Inland sand-dunes

Sand bodies of aeolian (wind-blown) origin, possessing constructional relief and separated from the coast and its dune cordons by non-dunal habitats, developed within the boreal, nemoral, continental steppe, warm-temperate humid, Mediterranean and subdesert steppe zones. They support a vegetation which differs markedly from coastal sand-dune communities.

Caves

Natural caves and cave systems.

In general, the listing of any habitat comprising less than 5% of the individual IBA area was discouraged during this inventory. Although this particular habitat-type usually comprised less than 5% of an IBA's area, it is sometimes ornithologically important (e.g. as a cliff-nesting site for raptors such as Lammergeier *Gypaetus barbatus*), therefore an effort was made to list this habitat whenever it was known to occur and/or be important, even if it comprised less than 5% of an IBA's area.

Artificial landscape*Highly improved reseeded grassland*

Heavily fertilized or reseeded permanent grasslands, sometimes treated by selective herbicides, with very impoverished flora and fauna.

Arable land

Fields of cereals, beets, sunflowers, leguminous fodder, potatoes and other annually harvested plants. Faunal and floral quality and diversity depend on the intensity of agricultural use and on the presence of borders of natural vegetation between fields. This category can include tree-lines, hedges, and rural mosaics, i.e. ligneous formations of small size, arranged in a linear, reticulated or insular manner, closely interwoven with grassy or cultivated habitats. Also included are combinations of such elements and mixed agricultural formations, containing both ligneous and herbaceous layers. Very artificial, disturbed or heterogeneous systems, containing many planted or exogenous elements can be listed here, while more natural ensembles utilising many natural elements and covering substantial surfaces are better classified under 'Forest and woodland' or 'Scrub'.

Perennial crops/orchards/groves

Ligneous crops other than forestry plantations. Such areas, when non-intensively managed, may support a rich flora and fauna.

Forestry plantation

Areas of planted forest or woodland, or tree-based crops, of native or exotic tree species, deliberately planted to supply timber, here generally taken to mean areas planted less than about 100–150 years ago. Such areas, when old or non-intensively managed, may support a rich flora and fauna.

Urban parks/gardens

Large gardens. Usually varied formations, created for recreational use.

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Other urban/industrial areas

Towns, villages, industrial sites. Areas used for human occupation and industrial activities.

Ruderal land

Fallow land, waste places. Fields set aside, abandoned or left to rest, roadsides and other interstitial spaces on disturbed ground. They are colonized by numerous pioneering, introduced or nitrophilous plants.

Introduced/exotic vegetation

This category includes all formations dominated by recently introduced or exotic plant species, apart from forestry plantations composed of such species, which are classified as 'Forestry plantation' under 'Artificial landscape'.

Unknown

This catch-all category was listed when the habitat covering part or all of an IBA's area was not known to the compiler of the data-sheet or database.

LAND-USES

The types of land-use in this classification are not mutually exclusive (e.g. forestry and recreation can use the same area of forest), therefore there is no requirement that the percentage covers of the different land-uses at an IBA should add up to 100%.

Agriculture

All land affected by cultivation, including perennial crops/groves/orchards, as well as all land affected by pastoral agriculture, including grazing lands and rangelands of livestock.

Fisheries/aquaculture

All land or water affected by commercial angling, fishing, aquaculture, mariculture, shellfish cultivation or harvesting, etc. Recreational angling was listed under 'Tourism/Recreation'.

Forestry

This term was taken to mean wooded land under active management for the extraction of timber and non-timber forest products, as well as for other non-extractive functions such as protection against erosion and avalanches, etc. and provision of amenity areas for recreation/tourism, etc.

Hunting

Although contributors were instructed to only list hunting as a land-use if the land was officially designated for hunting, this definition was not applied rigidly or consistently by contributors. This category tended to be listed for any land where hunting took place (i.e. the land was not necessarily designated officially for hunting *per se*).

Military

Any area of land or water used by the military, for any purpose.

Nature conservation/research

Contributors tended to apply this category only to land or water where 'Nature conservation/research' was a primary land-use, i.e. only to those protected areas with a relatively high level of protection or management for nature conservation, tending to ignore 'protected landscapes' and other such 'broader', less exclusive designations.

Not utilized

The relevant area is not used. In this inventory, some contributors listed this category to indicate that none of the other listed uses

occurred, not necessarily that the land was unused—this was corrected at the data-checking stage where possible.

Tourism/recreation

Although contributors were advised to only record this category if the land or water was allocated specifically for this use, e.g. on planning maps, in practice contributors usually listed this use for any areas of land or water that were used, directly or indirectly, for recreation, tourism or leisure activities, i.e. including infrastructural or built-up areas such as holiday villages and accommodation complexes.

Urban/industrial/transport

This category includes: general residential and built-up areas (not only in cities but also towns or villages); infrastructure other than for agriculture, forestry, fisheries, aquaculture, tourism/recreation or water management, i.e. mainly for transport and energy purposes, e.g. roads, bridges, railways, ports, airports, power-stations, pylon or pipeline networks, wind-farms, etc.; and non-built-up land used by commercial or industrial activities other than agriculture, forestry, fisheries, aquaculture, tourism/recreation or water management, i.e. such activities as extraction of oil/gas, mining of ores, peat, salt, gravel, etc.

Water management

This category includes the management of waterbodies such as rivers and lakes for purposes such as flood control, irrigation, storage (for drinking water, hydropower, cooling power-stations, etc.) and large-scale redistribution (to balance disturbed hydrology, facilitate engineering projects, etc.).

Unknown

This category was listed when the land-use, if any, over part or all of an IBA's area was not known to the compiler of the data-sheet or database.

Other

This catch-all category covers any human use of the IBA which cannot be classified under one of the other categories, and in this inventory included such activities/uses as: reed-cutting; firewood-gathering; traditional/artisanal salt-production; excavation of loess or marl in small quantities (i.e. not industrial/commercial); harvesting of animal/plant products such as cork, heather, berries, fungi, eggs/young/adults of birds; husbandry of wild species (e.g. Eider *Somateria mollissima* for eiderdown); ice-cutting.

THREATS

Threats can cause a reduction in bird populations at an IBA either directly, through causing increasing mortality at the site, or they can act indirectly by reducing the 'carrying capacity' of the site, by physically degrading or destroying habitats or by disturbing and interfering with birds' essential activities such as feeding, roosting, resting, moulting, nesting, and so on. Most of the categories of threat listed here are self-explanatory, or their listing at a site is accompanied by a specific justification/explanation in the text of the relevant IBA site-account in the inventory.

Threats tend to be posed mainly by human activities, and encompass not only the direct effects/impacts of the activity on the habitats and/or bird populations at the IBA but also those impacts/effects that are indirect or remote. For example, agricultural intensification/expansion quite far away from a wetland or heathland IBA, but upstream or upwind of it, can cause damaging nutrient pollution at the site, the nutrients being transported to the site by water flow or by atmospheric deposition.

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Calculating the importance score of the threat

To calculate the seriousness of the threat, in terms of the magnitude of its actual or potential impact, the following method was used:

For habitat-related threats:

- I. Effect of threat on the habitat
 - destruction (scores 3)
 - rapid deterioration (scores 2)
 - slow deterioration (scores 1)

- II. Spatial scale of the threat (in relation to the IBA)
 - affects the IBA as a whole (3)
 - affects a large part of the IBA but not critical sites for threatened species or a relatively small part of the IBA which is important for threatened species (2)
 - affects a relatively small part of the IBA with no crucial site for threatened species (1)

- III. Realization of threat
 - threat already exists (3)
 - threat is planned with realization expected in short term (2)
 - threat is planned with realization expected in longer term (1)

For bird-related threats:

- I. Expected/measured effect on threatened species
 - majority of critical species are affected (3)
 - some critical species are affected (2)
 - only non-critical species are affected (1)

- II. same as for habitat-related threats

- III. same as for habitat-related threats

The combined level of the threat is calculated by summing up the values in I, II and III.

Score (threat) = score (I) + score (II) + score (III)

For ranking purposes, the threats can be classified into three groups:

1. Level 'A' threats (high impact): scores 8 and 9
2. Level 'B' threats (medium impact): scores 6 and 7
3. Level 'C' threats (low impact): scores 3, 4 and 5

Abandonment/reduction of land management

Includes: undergrazing; rural depopulation leading to reduced carrion for scavengers; abandonment of salt-pans. Abandonment of fish-ponds is treated under 'Aquaculture/fisheries'.

Afforestation

Afforestation with exotic tree species should be treated here rather than under 'Consequences of animal/plant introductions'.

Agricultural intensification/expansion

Includes: irrigation (including indirect impacts, e.g. draw-down of water leading to predators reaching breeding colonies on islands, or reservoir being kept artificially high in summer, etc.); high fertilizer input; excessive use of chemicals; changes in crop species or cultivation; loss of habitats; overgrazing; effects of pest control on non-target species; nutrient pollution of wetlands as a result of agricultural intensification.

Aquaculture/fisheries

The threat is not solely from intensification or expansion of aquaculture/fisheries—abandonment or reduction of traditional or non-intensive aquaculture can also affect some waterbirds (cf. agriculture). This category includes: the persecution (shooting, etc.) of waterbirds that can occur at some fisheries/aquaculture sites; reduction in fish-farming due to economic crisis. If recreational angling causes a threat, this is listed under 'Recreation/tourism'.

Burning of vegetation

Fires that are not caused by natural events, i.e. all man-made fires, whether purposeful (e.g. to clear vegetation for grazing) or accidental or malicious.

Consequences of animal/plant introductions

Afforestation with exotic tree species should be treated under 'Afforestation' rather than here.

Construction/impact of dyke/dam/barrage

Includes such phenomena as water-level fluctuations in, or downstream of, hydropower reservoirs, changing levels of reservoirs or storage basins, altered sedimentation patterns downstream, etc.

Deforestation (commercial)

Includes clear-cutting (selective felling is treated under 'Selective logging/cutting'), illegal as well as legal.

Disturbance to birds

This threat is usually a consequence of other human activities than deliberate scaring, and thus is often listed in combination with other threat categories (ultimate factors), e.g. recreation/tourism or intensified forest management. Contributors to this inventory have often listed both 'Disturbance to birds' and the responsible activity too, to highlight the ultimate source of the disturbance. Active persecution of birds is generally classed as 'Other' threat, but when disturbance effects are more important than mortality effects, e.g. farmers shooting at Cranes *Grus grus* or geese *Anser/Branta* just enough to scare them away, then such activity is better classed under 'Disturbance'.

Drainage

Dredging/canalization

Includes creation of canals for irrigation.

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Includes exploration as well as extraction activities/infrastructure and any resultant pollution, covering all kinds of extraction, e.g. not just mining but oil/gas, peat (commercial extraction only), etc., as well as pollution occurring during transport (accidental discharge/deliberate cleaning of bilges of oil tankers, etc.).

Filling-in of wetlands

Used for active filling-in only, e.g. land-fill using excess spoil or waste material. If the wetland is filling in due to increased sedimentation or other indirect processes, the threat should be classified under the cause of the increase in sedimentation.

Firewood collection**Forest grazing**

Includes damaging grazing caused by over-population of wild deer (through winter-feeding by hunters, eradication of natural predators, etc.).

Groundwater abstraction**Industrialization/urbanization**

Includes construction, chemical run-off or spillage, sewage effluent, wind-farms, etc. Ideally, only includes physical developments (or attendant phenomena/processes) that are not related to tourism/recreation, forestry, agriculture, extraction, aquaculture/fisheries, dyke/dam/barrage construction, since all of these can be classified separately. Thus, this category generally includes housing, offices, factories, transport and energy developments, and generally the threat is posed by the addition of infrastructure to an existing urban area or other centre, whereas isolated examples of such development are better classed under 'Infrastructure'. Examples of threatening processes or related phenomena, rather than physical developments, include the industrialization (intensification) of salina-management, the occurrence of acid rain downwind of industrial sources. Coastal land-claim, e.g. for expanding industrial or urban areas, is included here, but land-claim of inland wetlands is classed under 'Filling-in of wetlands'. Waste disposal (where source of waste is unspecified) is also classed here.

Infrastructure

Generally involves energy (power-lines) and transport (roads, railways). Includes roads, railways, overhead transmission lines, etc. This can be difficult to separate from 'Industrialization/urbanization', but tends to be listed where developments are more 'isolated', not involving the addition of infrastructure to some pre-existing 'centre' or focus (e.g. town, etc.). Again, ideally this category should include only those developments that are not related to tourism/recreation, forestry, extraction industry, agriculture, aquaculture/fisheries or construction of dyke/dam/barrage, since these can be categorized separately. Proposed wind-farm. Airport pollution.

Intensified forest management

Management generally refers to production of timber, not of non-timber forest products (e.g. mushrooms, honey). Excessive collection of the latter should be classified as 'Other' threat.

Natural events

Includes drought, erosion (at normal levels), storms, nest destruction by native predators, etc. It is considered possible for 'Natural events' to pose threats to birds and habitats, despite the adaptations of all organisms to the naturally dynamic environment over millions of years, because the environment in Europe has been changed drastically (generally, simplified in an ecological sense) by man, especially over the last 100 years or so. Landscapes and nature in Europe are now so heavily modified by man, and maintained in that state by his activities, that organisms cannot depend on normal 'ecosystem processes' to occur. For example, the alteration of sedimentation patterns in estuaries by upstream dam-construction puts offshore sandbanks and coastal spits (potentially valuable habitat, e.g. to nesting terns *Sterna*), etc. at more risk of destruction by natural storms, with less possibility of their natural regeneration elsewhere in

the estuary. Following the eradication of top mammalian predators over much of Europe, there has been an increase in native nest-predators such as foxes, jackals and wild boars. Fires should be listed under this category only if they are stated to be natural—only 2–3% of boreal forest-fires, and less than 1% of Mediterranean forest-fires, are thought to be natural in origin (i.e. caused by lightning strike), all others being man-made according to European Commission reports, whether deliberate, accidental or malicious, and should be classed under 'Burning of vegetation'.

Recreation/tourism

As well as for direct impacts such as disturbance of birds, this category has been used to cover the impacts of 'hard' developments, e.g. building of hotels, holiday homes, etc.

Selective logging/cutting

Clear-cutting of forest/woodland should be treated under 'Deforestation'. This category includes the cutting/collection of branches as well as of whole trees, but applies only to trees and bushes, not to such vegetation as reeds, etc. (reed-cutting has been treated under 'Other' threat).

Shifting agriculture

This refers to swidden or slash-and-burn agriculture (more common in tropical forest countries than in Europe) or such practices as opportunistic ploughing and planting of desert/semi-desert (e.g. with barley/millet) after heavy rains, thus degrading or destroying the thin soil.

Unsustainable exploitation

'Exploitation' refers solely to birds, not to other natural resources such as reeds, forest fungi, etc., and thus includes unsustainable hunting (legal and illegal), egg-collection, husbandry of Eider *Somateria mollissima* for eiderdown, etc. Significant disturbance to birds caused by hunting should be classified under 'Disturbance to birds'.

Unknown

This category can only be used on its own, not with other threats—that is, it is not known what threats the site faces, if any.

Other

This catch-all category covers any threat to the IBA which cannot be classified under one of the other categories, and in this inventory included such threats as: various kinds of pollution for which the cause(s) cannot be (or were not) identified or which cannot be classed under other categories (e.g. fuel-oil pollution from unspecified kinds of boats; nutrient pollution or acid rain from unspecified sources; lead-shot pollution; radioactive contamination; water pollution by mosquito-control chemicals); deliberate persecution or incidental killing of birds (not exploitation *per se*), e.g. through poisoning of raptors, farmers shooting birds (except where disturbance effects are more important than mortality effects, when this threat should be classed under 'Disturbance to birds'); activities that threaten the site in an unexplained or unspecified way (military activity; heavy airport traffic; increased boat traffic; seaweed harvesting; hunting; hay-cutting; mussel-collecting; reed-cutting/harvesting); management of site is poor, inappropriate or lacking, especially water-management issues (water-level fluctuations; water transfer/abstraction of surface water); deer fences (effects unspecified); forest/soil degradation and tree disease (non-specific); excessive collection of non-timber forest products; transport of highly toxic chemicals through site (potential risk); outbreaks of botulism; algal blooms (cause unspecified).

References

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