Agreement on the Conservation of Albatrosses and Petrels

Third Meeting of Advisory Committee

Valdivia, Chile, 19 – 22 June 2007

IUCN – CMP
Unified Classification of Direct Threats

IUCN
The World Conservation Union

CMP
The Conservation Measures Partnership

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Unified Classification of Direct Threats

Version 1.0 – June 2006[1]

Q1: What do we mean by "direct threats"?

As shown in the following diagram, the work of conservation ultimately involves having a project team taking action to achieve certain desired outcomes among factors (direct threats, indirect threats, and opportunities) that affect biodiversity targets.

These terms can be formally defined as follows:

- **Targets** – The biological entities (species, communities, or ecosystems) that a project is trying to conserve. For example, a population of a specific fish species or a forest ecosystem. Synonymous with *conservation targets*, *biodiversity targets*, and *focal targets.*

- **Direct Threats** – The proximate (human) activities or processes that have caused, are causing or may cause the destruction, degradation and/or impairment of biodiversity and natural processes. For example, trawling or logging. Synonymous with *sources of stress* and *proximate pressures*.

- **Underlying Causes** – Factors, usually social, economic, political, institutional, or cultural in nature, that enable or otherwise contribute to the occurrence and/or persistence of direct threats. There is typically a chain of underlying causes behind any given direct threat. In a situation analysis, underlying causes can be subdivided into ***indirect threats*** (factors with a negative effect) and ***opportunities*** (factors with a positive effect). For example, market demand for fish or a country's land use planning system. Synonymous with *drivers* or *root causes.*

As will be discussed in more detail in the following sections, in this classification we focus on the direct threats.

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[1] This classification is the direct successor to Version 2.1 of the *IUCN Red List Threats Authority File* and the June 2005 Version of the *CMP Taxonomy of Direct Threats.* For the latest version of this document in html or pdf as well as a web-page on which you can provide comments and feedback, go to: http://www.iucn.org/themes/ssc/sis/classification.htm.

Q2: What are we trying to do and why?

We are trying to develop a standard classification of direct threats. There are three main reasons for developing such a classification:

- To help practitioners figure out what threats occur at their site. A project team can scan this classification and see if they recognize any threats that they may be overlooking in their analysis of the conditions at their site.
- To create general summaries or "roll-ups" for broader organizational purposes and/or use by senior managers, fundraisers, and external affairs staff. Summaries can tally the frequency of threats across projects at various organizational scales or be combined with other information for more detailed summaries.
- To facilitate cross-project learning and the development of a science of conservation. A common classification of conservation direct threats enables practitioners to search a database of conservation projects and find projects facing similar threats and (hopefully) to learn how these projects have dealt with these threats.

Q3: How will we know if we succeeded?

A good classification will meet the following criteria:

- **Simple** – Clear language, understandable to all practitioners.
- **Hierarchical** – Creates a logical way of grouping threats that are related to one another.
- **Comprehensive** – Covers all possible direct threats (at least at higher levels of the hierarchy).
- **Consistent** – All entries at a given level of the taxonomy are of the same type; the hierarchy does not "mix apples and oranges."
- **Expandable** – Is designed so as to enable new threats to be added to the taxonomy as they are discovered.
- **Exclusive** – Any given direct threat can only be placed in one cell within the hierarchy.
- **Scalable** – The same names can be used for direct threats at one site and across a continent.

As we developed this classification, we found that we were able to satisfy most of these criteria.

Q4: Are direct threats restricted to human activities? If so, why are natural disasters and weather events direct threats?

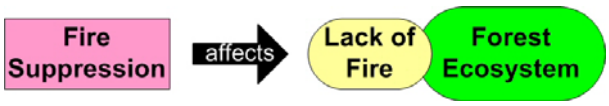
For the most part, direct threats are limited to human activities. Thus fires set by lighting or tropical storms that blow down large swaths of forest are not threats, but instead part of a natural (and often necessary) disturbance regime. There is a fine line, however, between a naturally occurring event such as a fire set by lightning and a human-caused threat such as a fire set by a match or even increased intensity of fires due to forest management practices. In general, we would regard the latter two as direct threats whereas the former is not.

However, if the forest fires set by lighting would potentially affect the last population of Javan rhinos, then we would have to regard it as a threat to this species, even if it is not a threat the

forest habitat itself. Following this logic, we have also included *geological events* and *climate change & severe weather* in our classification of direct threats. If humans were not putting pressure on species and ecosystems, than the effects of tropical storms, volcanoes, or even long-term climate change would just be part of the natural system. But in a human dominated world, if the last population of Javan rhinos is vulnerable to a tsunami, then clearly we have to regard the tsunami as a potential threat to the persistence of that species.

Q5: What is the difference between a direct threat and a stress? Are stresses included in this classification?

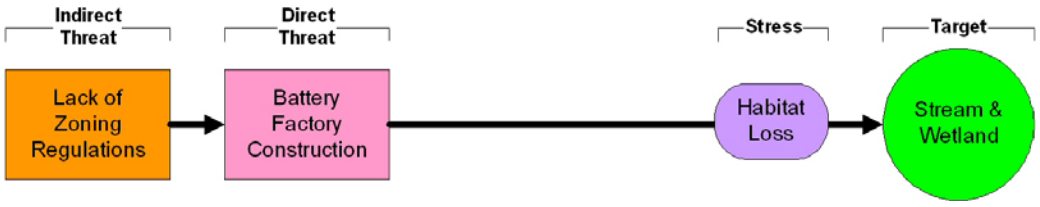
Some threat analysis systems (e.g., The Nature Conservancy's *CAP Framework* or the US Environmental Protection Agency's *Risk Assessment Framework)* make a distinction between a *direct threat* (aka *source of stress*) and the *stress* on the target. Stresses are impaired aspects of conservation targets that result directly or indirectly from human activities (e.g., low population size, reduced extent of forest system; reduced river flows, degraded water quality; lowered groundwater table level). As shown in the following diagram, a stress is not a threat in and of itself, but rather a condition of the target.



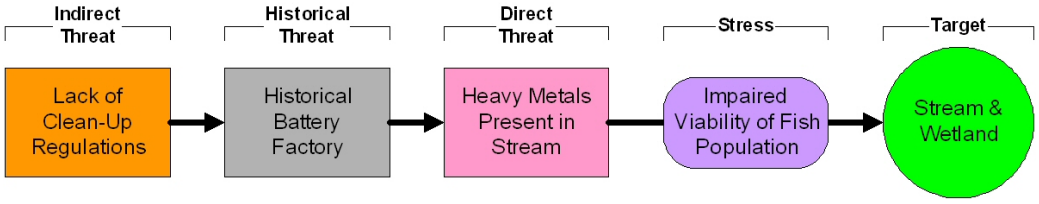
In this classification, we have tried to exclude stresses and focus primarily on the direct threats. Thus, for example, in **7. Natural System Modifications**, we have listed the human activity *fire suppression* rather than the stress *lack of fire.* In a few cases, however – most notably **8. Invasive & Other Problematic Species & Genes** and **9. Pollution** – the listings are what some people might consider stresses because they are often caused by specific human activities that could be considered direct threats. We have included them because they do function as direct threats that cause specific stresses to targets. For example, invasive species deliver stresses to conservation targets such as competition for water, nutrients, light, or germination space. Pollutants create stresses to conservation targets such as impaired reproductive health, reduced vigor, or excessive mortality. We have also included a brief classification of stresses for those people who might be interested in recording them for their work.

Q6: Can a factor be both a direct and indirect threat?

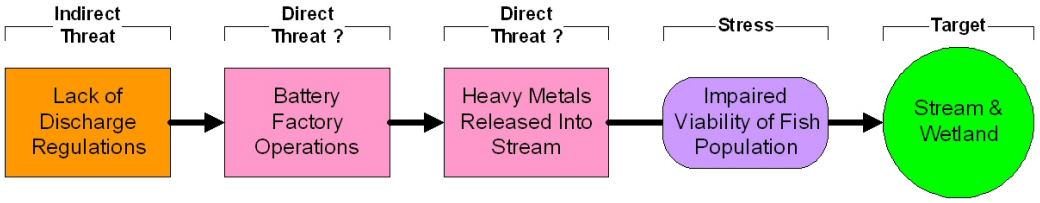
Unfortunately, the line between a direct threat and an indirect threat is not always clear – it is sometimes situational. In the following example, the direct threat is pretty clear:



And in the following example, it's also clear, albeit somewhat different:



But in the next example, it's not really clear whether the heavy metals or the battery factory should be considered the direct threat. It depends on whether the project team wants to focus on the heavy metals or the battery factory. If they pick the metals, it means in this case (unlike the first) the battery factory is now an indirect threat.



In general, we suggest that you don't worry too much about these cases – pick which ever factor seems to you like it should be the direct threat. The key thing is to identify your problems and then deal with them. This problem most often seems to surface when dealing with pollution threats; as such, the classification recommends that you record both the pollutant and the source of the pollution in your description of the direct threat.

Q7: Is this the only classification of its kind?

The classification in this document has been adapted from previous work including:

- Conservation Measures Partnership. 2005. *Taxonomy of Direct Threats.*
- IUCN. 2005. Threats Authority File. Available at http://iucn.org/webfiles/doc/SSC/RedList/AuthorityF/threats.rtf
- Salafsky, N., R. Margoluis, K.H. Redford, and J.G. Robinson. 2002. Improving the practice of conservation: A conceptual framework and research agenda for conservation science. *Conservation Biology* **16**: 1469-1479.
- Salafsky, N., D. Salzer, J. Ervin, T. Boucher, and W. Ostlie. 2003. *Conventions for Defining, Naming, Measuring, Combining, and Mapping Threats in Conservation: An Initial Proposal for a Standard System.* Draft Working Paper.

Q8: How will this classification be updated?

This classification is under the editorial authority of the IUCN Authority File Task Force of the IUCN Biodiversity Assessments Sub-Committee of the IUCN Species Survival Commission Steering Committee. It is our hope that this classification becomes the standard reference for direct threats around the world. For data management purposes, it is important to have classification systems that are relatively stable. At the same time, we obviously need the ability to have the classification systems grow and change over time. To this end:

- Version 1.0 was initially released in June 2006, after substantial review and testing.
- There will be 6 month public comment period and any necessary revisions will be made by December 2006, resulting in Version 1.1. You can provide comments and feedback at http://www.iucn.org/themes/ssc/sis/classification.htm.
- At the end of this time, the classifications will be locked until the end of 2008 (at least the Level 1 and Level 2 classifications). It will still be possible to adjust definitions and expositions and to add additional examples at Level 3. If substantial changes are made, the release will be with a new Version number (e.g. 1.2).
- A formal review process will begin in January 2009, culminating in the release of Version 2.0. We then anticipate repeating the cycle every four years thereafter.

Acknowledgements

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For more information about the IUCN Red List, go to www.redlist.org.

For more information about the Conservation Measures Partnership, go to www.ConservationMeasures.org.

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Level of Classification	Definition	
1 2 3	*Examples*	**Exposition**
1. Residential & Commercial Development	Threats from human settlements or other non-agricultural land uses with a substantial footprint	These are threats tied to a defined and relatively compact area, which distinguishes them from those in **4. Transportation & Service Corridors** which have a long narrow footprint, and **6. Human Intrusions & Disturbance** which do not have an explicit footprint.
1.1 Housing & Urban Areas	Human cities, towns, and settlements including non-housing development typically integrated with housing	This category obviously dovetails somewhat arbitrarily with **1.2 Commercial and Industrial Areas**. As a general rule, however, if people live in the development, it should fall into this category.
List the type of development	*urban areas, suburbs, villages, ranchettes, vacation homes, shopping areas, offices, schools, hospitals, birds flying into windows*	
1.2 Commercial & Industrial Areas	Factories and other commercial centers	Shipyards and airports fall into this category, whereas shipping lanes and flight paths fall under **4. Transportation & Service Corridors.** Dams are NOT included here, rather they are in **7.2 Dams & Water Management/Use.**
List the type of development	*military bases, factories, stand-alone shopping centers, office parks, power plants, train yards, ship yards, airports, landfills*	
1.3 Tourism & Recreation Areas	Tourism and recreation sites with a substantial footprint	There is a fine line between housing and vacation housing/resorts. Be careful not to confuse this category, which focuses on the habitat effects of recreation areas, with those in **6.1 Recreational Activities**, which focuses on the disturbance effects posed by recreation.
List the type of development	*ski areas, golf courses, resorts, cricket fields, county parks, afghan goat polo fields, campgrounds*	

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Level of Classification	Definition	
1 2 3	*Examples*	**Exposition**
2. Agriculture & Aquaculture	Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture	Threats resulting from the use of agrochemicals, rather than the direct conversion of land to agricultural use, should be included under **9.3 Agricultural & Forestry Effluents.**
2.1 Annual & Perennial Non-Timber Crops	Crops planted for food, fodder, fiber, fuel, or other uses	
List the specific crop(s) or farming system	*wheat farms, sugar cane plantations, rice paddies, hillside rice production, household swidden plots, banana or pineapple plantations, mango or apple orchards, olive or date groves, vineyards, oil palm plantations, tea or coffee plantations, mixed agroforestry systems, coca plantations*	
2.2 Wood & Pulp Plantations	Stands of trees planted for timber or fiber outside of natural forests, often with non-native species	If it is one or a couple timber species that are planted on a rotation cycle, it belongs here. If it is multiple species or enrichment plantings in a quasi-natural system, it belongs in **5.3 Logging & Wood Harvesting.**
List the specific tree species or farming system	*teak or eucalyptus plantations, loblolly pine silviculture, Christmas tree farms*	
2.3 Livestock Farming & Ranching	Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching)	In farming, animals are kept in captivity; in ranching they are allowed to roam in wild habitats. If a few animals are mixed in a subsistence cropping system, it belongs in **2.1 Annual & Perennial Non-Timber Crops**. Forage of wild resources for stall-fed animals falls under **5.2 Gathering Terrestrial Plants.**
List the specific animals and/or farming/ranching system	*cattle feed lots, chicken farms, dairy farms, cattle ranching, goat, camel, or yak herding*	
2.4 Marine & Freshwater Aquaculture	Aquatic animals raised in one location on farmed or non-local resources; also hatchery fish allowed to roam in the wild	Farmed animals are kept in captivity; hatchery fish are put into wild habitats and are the aquatic equivalent of terrestrial ranching.
List the specific animals and/or system	*shrimp or fin fish aquaculture, fish ponds on farms, hatchery salmon, seeded shellfish beds, artificial algal beds*	

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Level of Classification			Definition	
1	**2**	**3**	*Examples*	**Exposition**
3. Energy Production & Mining			Threats from production of non-biological resources	Various forms of water use (for example, dams for hydro power) could also be put in this class, but these threats seemed more related to other threats that involve alterations to hydrologic regimes. As a result, they should go in **7.2 Dams & Water Management/Use.**
	3.1 Oil & Gas Drilling		Exploring for, developing, and producing petroleum and other liquid hydrocarbons	Oil and gas pipelines go into **4.2 Utility & Service Lines**. Oil spills that occur at the drill site should be placed here; those that come from oil tankers or pipelines should go in **4. Transportation & Service Corridors** or in **9.2 Industrial & Military Effluents**, depending on your perspective.
		List the specific resource(s) and production method	*oil wells, deep sea natural gas drilling*	
	3.2 Mining & Quarrying		Exploring for, developing, and producing minerals and rocks	It is a judgement call whether deforestation caused by strip mining should be in this category or in **5.3 Logging & Wood Harvesting** - it depends on whether the primary motivation for the deforestation is access to the trees or to the minerals. Sediment or toxic chemical runoff from mining should be placed in **9.2 Industrial & Military Effluents** if it is the major threat from a mining operation.
		List the specific resource(s) and production method	*coal strip mines, alluvial gold panning, gold mines, rock quarries, sand/salt mines, coral mining, deep sea nodules, guano harvesting, dredging outside of shipping lanes*	
	3.3 Renewable Energy		Exploring, developing, and producing renewable energy	Hydropower should be put in **7.2 Dams & Water Management/Use.**
		List the specific resource(s) and production method	*geothermal power production, solar farms, wind farms (including birds flying into windmills), tidal farms*	

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Level of Classification 1 2 3	Definition *Examples*	Exposition
4. Transportation & Service Corridors	Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality	This class includes transportation corridors outside of human settlements and industrial developments. These corridors create specific stresses to biodiversity including especially fragmentation of habitats and lead to other threats including farms, invasive species, and poachers.
4.1 Roads & Railroads	Surface transport on roadways and dedicated tracks	Off-road vehicles are treated in the appropriate category in **6. Human Intrusions & Disturbance**. If there are small roads associated with a major utility line, they belong in **4.2. Utility & Service Lines.**
List the specific type of road	*highways, secondary roads, primitive roads, logging roads, bridges & causeways, road kill, fencing associated with roads, freight/passenger/mining railroads*	
4.2 Utility & Service Lines	Transport of energy & resources	Cell phone and other communication towers connected by small access roads belong here. If there are small utility lines using a road right of way, they belong in **4.1 Roads & Railroads.** Oil spills from pipelines should go in **9.2 Industrial & Military Effluents.**
List the specific type of utility line	*electrical & phone wires, aqueducts, oil & gas pipelines, electrocution of wildlife*	
4.3 Shipping Lanes	Transport on and in freshwater and ocean waterways	This category includes dredging and other activities that maintain shipping lanes. Anchor damage from dive boats belongs in **6.1 Recreational Activities.**
List the specific type of shipping lane	*dredging, canals, shipping lanes, ships running into whales, wakes from cargo ships*	
4.4 Flight Paths	Air and space transport	Airports fall into **1.2 Commercial & Industrial Areas**.
List the specific type of path	*flight paths, jets impacting birds*	

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Level of Classification	Definition	
1 2 3	*Examples*	**Exposition**
5. Biological Resource Use	Threats from consumptive use of "wild" biological resources including both deliberate and unintentional harvesting effects; also persecution or control of specific species	Consumptive use means that the resource is removed from the system or destroyed - multiple people cannot use the same resource, as they could under **6. Human Intrusions & Disturbance.** Threats in the class can affect both target species (harvest of desired trees or fish species) as well as "collateral damage" to non-target species (trees damaged by felling or fisheries bycatch) and habitats (coral reefs destroyed by trawling). Persecution/control involves harming or killing species because they are considered undesirable.
5.1 Hunting & Collecting Terrestrial Animals	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsistence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch	This category focuses on animals that primarily live in a terrestrial environment. There are obviously some species that live on the terrestrial/aquatic boundary. Hunting otters, beavers, amphibians, polar bears, penguins, waterfowl, and sea birds should (somewhat arbitrarily) go here. Hunting seals, whales and other marine mammals, and freshwater and marine turtles go in **5.4 Fishing & Harvesting Aquatic Resources.** Yes, most people "gather" honey, eggs, or insects or other slow moving targets, rather than "hunt" them. But it seems cleaner to keep all animal products as being hunted.
List the specific animal(s) and the method	*bushmeat hunting, trophy hunting of lions, beaver trapping, butterfly collecting, honey or bird nest hunting, wolf control, pest control, persecution of snakes because of superstition*	
5.2 Gathering Terrestrial Plants	Harvesting plants, fungi, and other non-timber/non-animal products for commercial, recreation, subsistence, research or cultural purposes, or for control reasons	This category focuses on plants, mushrooms, and other non-animal terrestrial species except trees which are treated in **5.3 Logging & Wood Harvesting.**
List the specific product(s) harvested and the method used	*wild mushroom collection, forage for stall fed animals, orchid collection, rattan harvesting, control of host plants to combat timber diseases*	
5.3 Logging & Wood Harvesting	Harvesting trees and other woody vegetation for timber, fiber, or fuel	Felling trees to clear agricultural land goes in the appropriate category in **2. Agriculture & Aquaculture.** If it is a few timber species that are planted on a rotation cycle, it belongs in **2.2 Wood & Pulp Plantations.** If it is multiple species or enrichment plantings in a quasi-natural system, it belongs here.
List the specific product(s) harvested and the method used	*clear cutting of hardwoods, selective commercial logging of ironwood, pulp or woodchip operations, fuel wood collection, mangrove charcoal production*	
5.4 Fishing & Harvesting Aquatic Resources	Harvesting aquatic wild animals or plants for commercial, recreation, subsistence, research, or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch	This category focuses on all kinds of species that are primarily found in an aquatic environment. There are obviously some species that live on the terrestrial/aquatic boundary. Hunting otters, beavers, amphibians, polar bears, penguins, waterfowl, and sea birds should (somewhat arbitrarily) go in **5.1 Hunting & Collecting Terrestrial Animals.** Hunting seals, whales and other marine mammals, and freshwater and marine turtles go here.
List the specific resource(s) and the method used	*trawling for tuna, blast fishing for grouper, spear fishing for sharks, shellfish harvesting, whaling, seal hunting, turtle egg collection, live coral collection, seaweed collection*	

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Level of Classification			Definition	
1	2	3	*Examples*	**Exposition**
6. Human Intrusions & Disturbance			Threats from human activities that alter, destroy and disturb habitats and species associated with non-consumptive uses of biological resources	Non-consumptive use means that the resource is not removed - multiple people can use the same resource (for example, birdwatching). These threats typically do not permanently destroy habitat except perhaps in extremely severe manifestations.
	6.1 Recreational Activities		People spending time in nature or traveling in vehicles outside of established transport corridors, usually for recreational reasons	This category does not include work involving consumptive use of biodiversity - for example disturbance impacts from loggers or hunters would be in the appropriate category in **5. Biological Resource Use.** Vehicles and boats in established transport corridors go in **4. Transportation & Service Corridors.** The development of permanent recreational or tourist facilities (such as hotels and resorts) should be included under section **1.3 Tourism & Recreation Areas** rather than here.
		List the specific activity	*off-road vehicles, motorboats, motorcycles, jet-skis, snowmobiles, ultralight planes, dive boats, whale watching, mountain bikes, hikers, cross-country skiers, hangliders, birdwatchers, scuba divers, pets brought into recreation areas, temporary campsites, caving, rock-climbing*	
	6.2 War, Civil Unrest & Military Exercises		Actions by formal or paramilitary forces without a permanent footprint	This category focuses on military activities that have a large impact on natural habitats, but are not permanently restricted to a single area. Permanent military bases should go under **1.2 Commercial & Industrial Areas**. Other military activities might best be assigned to other categories. For example, hunting of specific animals by soldiers living off the land fits under **5.1 Hunting & Collecting Terrestrial Animals.**
		List the specific activity	*armed conflict, mine fields, tanks & other military vehicles, training exercises & ranges, defoliation, munitions testing*	
	6.3 Work & Other Activities		People spending time in or traveling in natural environments for reasons other than recreation or military activities	This will probably not be a commonly used category.
		List the specific activity	*law enforcement, drug smugglers, illegal immigrants, species research, vandalism*	

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Level of Classification			Definition	
1	2	3	*Examples*	Exposition
7. Natural System Modifications			Threats from actions that convert or degrade habitat in service of "managing" natural or semi-natural systems, often to improve human welfare	This category deals primarily with changes to natural processes such as fire, hydrology, and sedimentation, rather than land use. Thus it does not include threats relating to agriculture (which should be under **2. Agriculture & Aquaculture**), or infrastructure (**1. Residential & Commercial Development** and **4. Transportation & Service Corridors)**
	7.1 Fire & Fire Suppression		Suppression or increase in fire frequency and/or intensity outside of its natural range of variation	This category focuses on the human activities that lead to either not enough fire or too much fire in the ecosystem in question. If fire escapes from established agricultural lands, it belongs here, if fire is used to clear new agricultural lands, it belongs in the appropriate category in **2. Agriculture & Aquaculture.** It also includes damaging "natural" fires in systems that have lost their natural resilience.
		List the specific source of the fire or lack of fire	*fire suppression to protect homes, inappropriate fire management, escaped agricultural fires, arson, campfires, fires for hunting*	
	7.2 Dams & Water Management/Use		Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities	This category focuses on the human activities that lead to either not enough water or too much water in the ecosystem in question. Note that homogenizing flows to a constant level may be outside the "natural range of variation." Dredging belongs in **4.3 Shipping Lanes.**
		List the specific source of the alteration	*dam construction, release of too little or cold water from dam operations, sediment control, change in salt regime, wetland filling for mosquito control, levees and dikes, surface water diversion, groundwater pumping, channelization, ditching,*	
	7.3 Other Ecosystem Modifications		Other actions that convert or degrade habitat in service of "managing" natural systems to improve human welfare	
		List the specific source of the alteration	*land reclamation projects, abandonment of managed lands, rip-rap along shoreline, mowing grass, tree thinning in parks, beach construction, removal of snags from streams*	

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1	2	3	*Examples*	**Exposition**
8. Invasive & Other Problematic Species & Genes			Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread and/or increase in abundance	We spent a lot of time talking to experts about the subdivisions and phrasing of this class. They would like to restrict the use of "invasive species" to refer to non-native species to keep things simple for policy makers. They recommended using the term "problematic native species" to refer to native species that have become superabundant or otherwise cause problems. If possible, also record the source of the invasive species and/or conditions that exacerbate their effect.
	8.1 Invasive Non-Native/Alien Species		Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities	We are defining non-native/alien/exotic species as those brought either intentionally or accidentally by humans in the last 10,000 years.
		List the specific plant, animal, or microbe	*feral cattle, household pets, zebra mussels, Dutch elm disease or chestnut blight, Miconia tree, introduction of species for biocontrol, chytrid fungus affecting amphibians outside of Africa*	
	8.2 Problematic Native Species		Harmful plants, animals, or pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become "out-of-balance" or "released" directly or indirectly due to human activities	It is a bit of a judgement call as to when a species becomes "problematic" (aka outside its natural range of variation). This category could probably be refined over time.
		List the specific plant, animal, or microbe	*overabundant native deer, overabundant algae due to loss of native grazing fish, native plants that hybridize with other plants, plague affecting rodents*	
	8.3 Introduced Genetic Material		Human altered or transported organisms or genes	Hatchery fish are not necessarily invasive species, but they can upset the gene pool of native fish.
		List the specific material or organism	*pesticide resistant crops, hatchery salmon, restoration projects using non-local seed stock, genetically modified insects for biocontrol, genetically modified trees, genetically modified salmon*	

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Level of Classification 1 2 3	Definition / *Examples*	Exposition
9. Pollution	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources	This class deals with exotic or excess materials introduced to the environment. There is obviously a fine distinction when the pollution comes from another threat - for example, should an oil spill from a pipeline be classified as **4.2 Utility & Service Lines** or **9.2 Industrial & Military Effluents**? You will have to exercise some judgement here as to which represents the direct threat in your situation. In some cases, the source of the pollution may be either unknown or from a historical source (e.g., heavy metals buried in sediments). In these cases, you may have to make an educated guess as to which category to assign the pollutant.
9.1 Household Sewage & Urban Waste Water	Water-borne sewage and non-point runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments	This category does not include major industrial discharge, which falls under **9.2 Industrial & Military Effluents**. It does include chemicals and next generation pollutants (caffeine or pharmaceuticals) in household waste streams. Technically, sewage from a pipe is "point-source" whereas a leaking septic system is "nonpoint-source." This category does not include agricultural runoff, which falls under **9.3 Agricultural & Forestry Effluents**.
List the type, source, and if possible, the specific pollutants of concern	*Discharge from municipal waste treatment plants, leaking septic systems, untreated sewage, outhouses, oil or sediment from roads, fertilizers and pesticides from lawns and golf-courses, road salt*	
9.2 Industrial & Military Effluents	Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments	The source of the pollution is often far from the system – an extreme example are the heavy metals that migrating eels bring to the Sargasso Sea. Often, the pollutants only become a problem when they bioconcentrate through the food chain. Oil spills from pipelines should generally go here.
List the type, source, and if possible, the specific pollutants of concern	*toxic chemicals from factories, illegal dumping of chemicals, mine tailings, arsenic from gold mining, leakage from fuel tanks, PCBs in river sediments*	
9.3 Agricultural & Forestry Effluents	Water-borne pollutants from agricultural, silivicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on the site where they are applied	Wind erosion of agricultural sediments or smoke from forest fires goes in **9.5 Air-Borne Pollutants**.
List the type, source, and if possible, the specific pollutants of concern	*nutrient loading from fertilizer run-off, herbicide run-off, manure from feedlots, nutrients from aquaculture, soil erosion*	
9.4 Garbage & Solid Waste	Rubbish and other solid materials including those that entangle wildlife	This category generally is for solid waste outside of designated landfills - landfills themselves should go in **1.2 Commercial & Industrial Areas.** Likewise, toxins leaching from solid waste - for example, mercury leaking out of a landfill into groundwater - should go in **9.2 Industrial & Military Effluents**.
List the type, source, and if possible, the specific pollutants of concern	*municipal waste, litter from cars, flotsam & jetsam from recreational boats, waste that entangles wildlife, construction debris*	

IUCN - CMP Unified Classification of Direct Threats

Version: 1 June 2006

Level of Classification			Definition	
1	2	3	*Examples*	**Exposition**
	9.5 Air-Borne Pollutants		Atmospheric pollutants from point and nonpoint sources	It may be difficult to determine the sources of many atmospheric pollutants – and thus hard to take action to counter them.
		List the type, source, and if possible, the specific pollutants of concern	*acid rain, smog from vehicle emissions, excess nitrogen deposition, radioactive fallout, wind dispersion of pollutants or sediments, smoke from forest fires or wood stoves*	
	9.6 Excess Energy		Inputs of heat, sound, or light that disturb wildlife or ecosystems	These inputs of energy can have strong effects on some species or ecosystems.
		List the type, source, and if possible, the specific pollutants of concern	*noise from highways or airplanes, sonar from submarines that disturbs whales, heated water from power plants, lamps attracting insects, beach lights disorienting turtles, damaging atmospheric radiation resulting from ozone holes*	

IUCN - CMP Unified Classification of Direct Threats

Version: 1 June 2006

Level of Classification	Definition	
1 2 3	*Examples*	**Exposition**
10. Geological Events	Threats from catastrophic geological events	Strictly speaking, geological events may be part of natural disturbance regimes in many ecosystems. But they need to be considered a threat if a species or habitat is damaged from other threats and has lost its resilience and is thus vulnerable to the disturbance.
10.1 Volcanoes	Volcanic events	
List the specific problem	*eruptions, emissions of volcanic gasses*	
10.2 Earthquakes/Tsunamis	Earthquakes and associated events	
List the specific problem	*earthquakes, tsunamis*	
10.3 Avalanches/Landslides	Avalanches or landslides	
List the specific problem	*avalanches, landslides, mudslides*	
11. Climate Change & Severe Weather	Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events that are outside of the natural range of variation, or potentially can wipe out a vulnerable species or habitat	Strictly speaking climatic events may be part of natural disturbance regimes in many ecosystems. But they are a threat if a species or habitat is damaged from other threats and has lost its resilience and is thus vulnerable to the disturbance. Many climatic events may also be increasing in frequency or intensity outside their natural range of variation due to human causes.
11.1 Habitat Shifting & Alteration	Major changes in habitat composition and location	This category focuses primarily on the habitat effects of climate change.
List the specific problem	*sea-level rise, desertification, tundra thawing, coral bleaching*	
11.2 Droughts	Periods in which rainfall falls below the normal range of variation	
List the specific problem	*severe lack of rain, loss of surface water sources*	
11.3 Temperature Extremes	Periods in which temperatures exceed or go below the normal range of variation	
List the specific problem	*heat waves, cold spells, oceanic temperature changes, disappearance of glaciers/sea ice*	
11.4 Storms & Flooding	Extreme precipitation and/or wind events	
List the specific type of storm	*thunderstorms, tropical storms, hurricanes, cyclones, tornados, hailstorms, ice storms or blizzards, dust storms, erosion of beaches during storms*	

IUCN - CMP Unified Classification of Stresses

Version: 1 June 2006

Level of Classification	Definition	
1 2 3	*Examples*	**Exposition**
1. Ecosystem/Community Stresses	Stresses that affect ecosystems and communities	
1.1 Ecosystem Conversion	Direct and complete conversion of the ecosystem. *Clear-cutting or flooding forest; eliminating a stream; removing a coral reef*	Grey area between total conversion and severe degradation.
1.2 Ecosystem Degradation	Direct damage to an ecosystem's biotic and/or abiotic biological condition. *Selective removal of species; removal of top predators; altered fire or hydrological regime*	
1.3 Indirect Ecosystem Effects	Indirect damage to an ecosystem. *Fragmentation or isolation of an ecosystem*	
2. Species Stresses	Stresses that affect specific species or guilds/groups of species	
2.1 Species Mortality	Direct killing or capturing of species. *Intentional or accidental killing of species*	Not always clear if this is aimed at the individual or the population. Culling buffalo?
2.2 Species Disturbance	Direct damage to a species. *Disruption of critical lifecycle stages*	
2.3 Indirect Species Effects	Indirect damage to a species. *Inbreeding, loss of pollinator or host, increased competition, loss of mutualism*	