



Mitigating biodiversity impacts of sports events



These guidelines are part of a series produced by IUCN on sport and biodiversity. The first guidelines, *Sport and Biodiversity*, were published in 2018 and give a broad overview of the topic. The second, published in 2019, *Mitigating biodiversity impacts of new sports venues*, look at the development of new venues for sports and their impacts on biodiversity.

These latest guidelines focus on ways to mitigate biodiversity impacts associated with sports events. They are divided into two parts: Part 1 **Laying the foundations** provides recommendations for the concept, strategy and planning phases; Part 2 **Delivering the sports event** focusses on measures to implement as the event takes place.

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Executive summary

Changing societal values and the expectations of spectators, athletes and sponsors are becoming increasingly significant in the sports sector.¹ There is growing recognition of the need for sport and sports events to be conducted in socially and environmentally responsible ways and this is reflected in the attitudes of governments, public authorities and regulators.

This means that taking a proactive and diligent approach to environmental management is a vital part of the sport sector's licence to operate as well as growing and sustaining fan bases. Although it may not always seem a predominant issue, biodiversity conservation should be a key element in any environmentally responsible approach to sports event management.

These guidelines focus on the often complex links between biodiversity and sport. As many sports events depend on a healthy natural environment, it is critical that the environment is not harmed. Outdoor events can have a range of direct and indirect negative biodiversity impacts which may include damaging natural areas and disturbing sensitive species. Physical impacts come from modifying areas, compacting soil, trampling vegetation, and

accidents such as fires. Pollution may be caused by litter, fuel and chemical spills, or wildlife disturbed through increased noise, lighting or simply the presence of people in sensitive areas. There have also been cases where invasive species from outside the area have been unintentionally introduced to a venue. Biodiversity impacts can also go beyond the event venue and affect species and habitats some distance away as a result of waste disposal, water and energy use, sourcing practices and travel. The significance of these impacts differs depending on the type of sport being hosted, the size of the event, and when and where it takes place.

The guidelines highlight that sports events can also benefit biodiversity. Each event offers an opportunity to raise public awareness of the value of nature and influence attitudes towards biodiversity and its conservation. There is the potential to reach large audiences, at the event and via press, broadcast and social media, as well as through advocacy by athletes and sponsors. Setting an example in the way the event is delivered and drawing attention to the flora and fauna in and around the venue can encourage more people to appreciate nature and support conservation efforts.

¹ Trendafilova *et al* 2014.



Whatever the event, all parties responsible for its planning and delivery should be aware of the potential impacts and opportunities in relation to biodiversity, take steps to mitigate negative impacts and find ways to achieve positive outcomes for nature.

These guidelines provide all the parties involved in the organisation of sports events with an overview of the issues and risks. They also offer help on how to make informed choices in avoiding harmful impacts and achieving positive outcomes. The guidelines stress that biodiversity should be considered through every phase of the event lifecycle, from planning through to delivery. All parties involved in the planning and delivery of sports events are responsible for understanding and managing the potential biodiversity impacts and opportunities to ensure no lasting harm, and preferably a lasting positive legacy.

The guidelines are in two parts: Part 1 deals with planning for the effective management of biodiversity opportunities and impacts through the concept phase, and through strategic and detailed planning of the sports event. Part 2 outlines a series of actions the service providers involved in a sports event can take to mitigate negative impacts on biodiversity. These actions should be taken during the setting up, staging and taking down phases of the event. Part 2 also describes opportunities to generate benefits for biodiversity, not only in the short term but with a view to leaving a positive legacy from the event.



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Glossary of terms, abbreviations and acronyms

Active mobility	A form of transport of people and sometimes goods that only uses human physical activity for locomotion. It includes walking, cycling, running and skateboarding among others.
Athlete	Used generically to refer to all competitors in sports events.
BCI	Better Cotton Initiative
Biodiversity	The variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems (Convention on Biological Diversity, 1992).
CBD	Convention on Biological Diversity
Certification	Written assurance of the conformity of a process, product or service to a pre-determined scope and set of requirements laid out in a standard. The most credible form of certification is third party, ideally by a certification body accredited to audit the standard in question.
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora. CITES is an international agreement between governments, which aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival.
Commissioning	Commissioning (in the context of these guidelines) is the strategic activity of identifying the need for a sports event, allocating resources and procuring a provider to best meet that need, within available means.
Conservation status	Category of threat to, and likelihood of, the continued existence of a species or ecosystem.
Delivery partner	An entity that has formal decision-making responsibilities towards planning and delivering an event.
Direct impact	An outcome directly attributable to a defined action or project activity; often also called a primary impact (BBOP, 2012, Glossary).
Eco-friendly	Not harmful to the natural environment.
Ecology	The branch of biology that deals with the relations of organisms to one another and to their physical surroundings. It includes the study of the distribution and abundance of organisms, how their populations function and the structure and function of ecosystems.
Ecosystem	A dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit (Convention on Biological Diversity, 1992).
Ecosystem services	The benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling (BBOP, 2012, Glossary).
Event organiser	The person/entity responsible for directing and coordinating the planning, promotion and delivery of a sports event.
Event owner	The rights holder of a sports event, typically a sport governing body but can also be commercial organisations and public bodies.
Federation	A union of (non-governmental) sports associations at national or international level administering and organising a particular sport, namely through competitions, and setting the rules for that sport.

FIS	International Ski Federation
Flagship species	A species that acts as an icon or symbol for a particular habitat, issue, campaign or environmental cause.
Fragmentation of habitat	The disruption and spatial and functional break-up of extensive habitats into isolated and small patches, interspersed with other habitats. Habitat fragments can only support small populations of fauna, which are more vulnerable to extinction. The patches may not even be habitable by species occupying the original undivided habitat. Fragmentation often prevents species migrating between populations and is therefore expected to lead to losses of species diversity in the longer term (CBD Biodiversity Glossary).
FSC	Forest Stewardship Council. The FSC sets standards on forest products and timber, certifying and labelling them as eco-friendly.
GEO	Golf Environment Organisation
Geotextiles, geofabric	Permeable synthetic fabrics that are used to stabilise, reinforce and protect soils from erosion.
Grey water	Wastewater from washing which may contain soaps or detergents.
GWP	Global Warming Potential
Habitat	The place or type of site where an organism or population of a species naturally occurs (Convention on Biological Diversity, 1992).
Habitat degradation	The diminishment of habitat quality, which results in a reduced ability to support flora and fauna species. Human activities leading to habitat degradation include polluting activities and the introduction of invasive species. Adverse effects can be immediately noticeable but can also have a cumulative nature. Biodiversity will eventually be lost if habitats become degraded to an extent that species can no longer survive (CBD 2008, Biodiversity Glossary).
Important areas for biodiversity	Areas recognised to be important for the conservation of particular wild species and their habitats, ecosystems, ecological processes, and/or for maintaining priority ecosystem services.
Indirect impact	Impact triggered in response to the presence of the project, rather than being directly caused by the project's own operations, often produced away from or as a result of a complex pathway; sometimes called secondary or induced impacts (BBOP, 2012, Glossary).
Invasive alien species	Plants, animals, pathogens and other organisms that are non-native to an ecosystem and which may cause economic or environmental harm or adversely affect human health (Convention on Biological Diversity, 1992).
IOC	International Olympic Committee
IUCN	International Union for Conservation of Nature
Leaching	The loss of water-soluble plant nutrients from the soil due to irrigation and rain.
Materiality assessment	The process of identifying, refining and assessing numerous potential sustainability issues that could affect an organisation and its stakeholders, and condensing them into a short-list of topics that inform corporate strategy, targets and reporting.
Mitigation hierarchy	A tool that aims to help manage biodiversity risk and is commonly applied in EIAs and ESIA's. Includes a hierarchy of steps: avoidance, minimisation, restoration, and offset (adapted from BBOP and UNEP Finance Initiative, 2010).
Modified habitats	Areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition (IFC, 2012, Performance Standard 6).
MSC	Marine Stewardship Council
Natural habitats	Areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition (IFC, 2012, Performance Standard 6).

Net gain of biodiversity or net positive impact for biodiversity	A target for a development project in which the impacts on biodiversity caused by the project are balanced or outweighed by measures taken to avoid and minimise the project's impacts, to undertake on-site restoration, and finally to offset the residual impacts, so that no loss remains. Where the gain exceeds the loss, the terms 'net gain' or 'net positive impact' may be used instead of 'no net loss' (BBOP, 2012, Glossary).
NFL	National Football League
NGO	Non-governmental Organisation
No net loss of biodiversity	The point at which the project-related impacts on biodiversity are balanced by measures taken to avoid and minimise the project's impacts, to undertake on-site restoration, and finally to offset significant residual impacts, if any, on an appropriate geographic scale (BBOP, 2012, Glossary).
OECD	Organisation for Economic Cooperation and Development
Organising Committee	An entity tasked with planning and implementing a sports event.
Overlay	The temporary elements needed for an event such as seating, tents, barriers, banners, toilets etc. They are either added to a permanent venue or used to create a temporary one.
Positive outcome for biodiversity	In the context of these guidelines, going beyond mitigating the impacts of a sporting event so that there is no lasting harm, and taking additional steps (not necessarily linked to the event's impacts) to support biodiversity conservation in the host area and further afield, into the future (also referred to as 'leaving a positive legacy for biodiversity').
Procurement	The process of acquiring goods, works and services.
Protected area	A clearly defined geographical space, recognised, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN, 2008).
Restoration	The return of an ecosystem or habitat to its original community structure, natural complement of species and natural functions (CBD, 2008, Biodiversity Glossary).
RSPO	Roundtable for Sustainable Palm Oil
Semi-natural	Habitats and/or landscapes that have been modified by human influence but retain many natural features. See also modified habitats.
Set up	The delivery and installation of all temporary and portable infrastructure and services needed to stage a sports event.
Significant impact	An impact that is outside the limit of acceptance or may result in non-compliance with accepted environmental quality standards, thresholds, or targets.
Sponsor/sponsorship	Sponsorship is a cash and/or value-in-kind (VIK) fee paid to a sports organisation by a business or organisation in return for the right to associate a brand/location with the sports event.
Sports event	Any planned and organised sports competition held at a specific time and place.
Supply chain	The sequence of activities or parties that provides goods or services to an organisation.
Take down	The removal of all temporary and portable infrastructure and services used at a sports event.
Threatened species	Species categorised as Critically Endangered, Endangered, or Vulnerable by The IUCN Red List of Threatened Species™. The Red List is widely recognised as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species (IUCN Red List of Threatened Species™).
Venue	The place, building, site, route or structure where a sports event is held. In these guidelines, the term is used broadly to include the land, buildings, equipment, built infrastructure (e.g. power lines) and services needed to enable events to take place. This includes natural sites, event routes, and open waters where there are no formal venue boundaries.

Venue Use Agreement	A formal agreement between an event organiser and a host venue that specifies among other things, the period of use of the venue for the event, any special conditions and how, when and in what condition the site has to be returned to the owner.
UEFA	Union of European Football Associations
UNDP	United Nations Development Programme
Wildlife	Living, non-domesticated animals and plants (fauna and flora).
WWF	World Wide Fund for Nature





Introduction

Who should read these guidelines

These guidelines have been developed for all parties involved in the planning and delivery of sports events or whose activities could affect biodiversity including:

- Event owners
- Event organisers and organising committees including the functional leads for areas such as competitions, spectator services, energy, logistics, waste management, marketing, or procurement.
- Public authorities responsible for permitting, licensing and/or funding an event
- Venue/site managers
- Contractors

- Sponsors
- Broadcasters
- Sports teams and athletes

It is assumed that readers of these guidelines do not have specialist knowledge of biodiversity, ecology and environmental management. However, there are many sports venue managers who have extensive experience in land management disciplines such as agronomy and horticulture, and practical environmental skills. These guidelines are also relevant to third parties such as environmental NGOs, academics and students who wish to better understand what is involved in staging sports events and the implications for biodiversity.

Scope of the guidelines

These guidelines apply to all types and sizes of sports events, whenever and wherever they occur. At some level, biodiversity conservation is relevant for all events. Even where there isn't a blade of grass or a tree in sight, tackling other subjects like climate change through policies on sourcing, travel, energy, water resource and waste management, will contribute to biodiversity conservation.

In terms of potential direct biodiversity impacts they are mostly relevant to outdoor sports events and bigger events involving large audiences and media coverage. However, even the organisers of small events can take steps to avoid ecological impacts and help conserve nature.

Together, the two parts of these guidelines – *Laying the foundations* and *Delivering the sports event* span all stages of the event lifecycle. For each stage, guidance is offered on potential biodiversity issues and risks, as well as steps to minimise impacts and conserve biodiversity.

The potential biodiversity impacts relate to the type of sport, size and timing of the event, and the

ecological value of the area in which the event takes place. These guidelines focus on activities at or in the vicinity of the event venue. Often this will be a dedicated sports venue, but many events take place in open country, in protected areas, along roads, in public parks, on water bodies or at sea where there are no defined boundaries. Aside from the location and site conditions, there are other important aspects of event planning that can have indirect and far-reaching impacts on biodiversity. These include carbon emissions from moving people and goods to and from the event, sourcing materials such as timber, cotton and food, and waste disposal. These operational aspects of event management are also addressed in these guidelines.

Finally, while the focus of these guidelines is on biodiversity, it is often the case that biodiversity considerations are handled as part of a broader approach to an event's sustainability rather than as a separate topic.

For a sport event taking place at a venue being built specifically for it, these guidelines should be used in conjunction with the IUCN *Guidelines for mitigating biodiversity impacts of new sports venues*.²

2 Brownlie 2019.

What is biodiversity and why is it important?

Biodiversity means the variability among living organisms from all sources, including terrestrial, aquatic and marine ecosystems, and the ecological complexes of which they are part.³ It refers to the total variety of living things, from genes to species to ecosystems. Biodiversity is a crucial component of nature or the natural environment, and species of wild animals and plants are collectively termed wildlife. Biodiversity includes the diversity of all ecosystems, from urban environments to largely natural areas and remote wilderness areas. While natural areas typically contain higher levels and/or more unique components of biodiversity than modified areas, conservation efforts should consider all biodiversity.

Conserving biodiversity is fundamental for sustainable development, as highlighted in the United Nations

Sustainable Development Goals.⁴ Ecosystem services, namely life-support services, sustain livelihoods, health and wellbeing, and make life both possible and worth living. Nature and its services to people are deteriorating worldwide and, without urgent action, around a million species face extinction in the next few decades.⁵ Biodiversity is affected by climate change, with negative consequences for human wellbeing. But biodiversity, through the ecosystem services it supports, also makes an important contribution to both climate change mitigation and adaptation.⁶

For more information on biodiversity, ecosystem services and conservation, please refer to the *IUCN Guidelines for mitigating biodiversity impacts of new sports venues*.⁷

The event lifecycle

The most effective way to manage the potential impacts of sports events on biodiversity is to take action as early as possible. Typically, the organisation of sports events follows a lifecycle which includes two main phases. The first one focusses on planning, or laying the foundation and the second focusses on delivering the event. Each can be broken down into three phases (Figure 1).

A typical event profile has a relatively long lead-in time, a spike of activity setting up and staging the event followed by a rapid take down and clear-up period. Depending on the scale of the event, the timeline can range from several months to a decade or more, but the general profile and phasing is the same whatever the timescale. Biodiversity conservation should be addressed through every phase.

In these guidelines:

PART 1, *Laying the foundations*, covers the planning phase for a sports event which can be split into three successive stages:

- **Concept** – defining the scope, location and timing of the event. In many cases this involves a bidding process, or at least the selection of preferred venues/sites.
- **Strategic planning** – defining the organisational governance and main policies and processes required.
- **Detailed planning** – detailed design and layout of the venue, sourcing goods and services and mapping out functional requirements so that everyone is aware of their responsibilities and competent to undertake their tasks.

3 Convention on Biological Diversity: <https://www.cbd.int/convention/articles/default.shtml?a=cbd-02>

4 United Nations (UN) declaration 2015: the 2030 Agenda for Sustainable Development. Biodiversity conservation is central to at least two of the UN Sustainable development Goals: SDG14 (Life below Water) and SDG15 (Life on Land). <https://sustainabledevelopment.un.org/sdgs>

5 Inter-governmental Platform on Biodiversity and Ecosystem Services (IPBES) 2019: Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

6 <https://www.cbd.int/climate/>

7 Brownlie 2019.

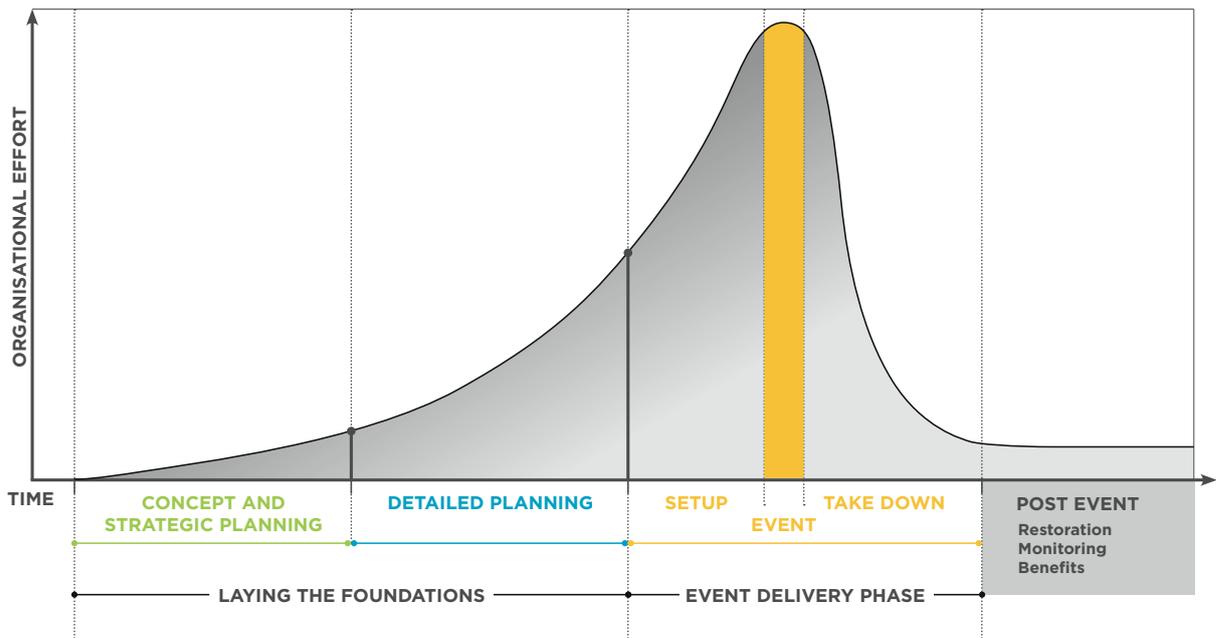


Figure 1: The sports event lifecycle.

PART 2, *Delivering the sports event*, is devoted to event delivery – the on-site period – and also encompasses three main stages:

- **Setting-up** – pre-event works: installation of all temporary infrastructure, services and equipment and laying out the site and access routes, car-parking etc.
- **Staging the event** – managing all sports and any cultural activities taking place and all supporting services such as transport, catering, waste management, stewarding, public address, lighting etc.
- **Taking down** – post-event removal of all temporary infrastructure, services and equipment, clearing up the site and where required, restoring the site to an agreed condition. Post-event activities can involve a range of measures to ensure that the event benefits biodiversity, building on actions taken during earlier phases.

All six of these stages are interrelated. Successful event delivery depends on effective, early planning and this includes addressing biodiversity. The delivery phase is where biodiversity impacts – positive and negative – will take place but their magnitude will be strongly influenced by the policies, plans and controls established early on.

Particularly significant is the post-event or ‘legacy’ phase of an event which is covered in more detail later. This varies in length but represents the period over which legacy outcomes are realised. For biodiversity these may include improvements to wildlife habitats, on-going conservation monitoring and management works, and increased awareness of biodiversity conservation. This phase could also include work to repair any environmental damage caused by the event. The key to successful legacy outcomes for biodiversity rests with input during the concept and initial planning stages. Essentially, the earlier the intervention, the lower the risks and impacts will be during the event and greater the benefits afterwards.

Links between sports events and biodiversity

Event owners and organisers are increasingly realising the need to address sustainability issues in the planning and delivery of sports events. Sustainability

encompasses a broad range of subjects and the role of biodiversity does not always seem obvious or significant.

Environmental quality goes hand-in-hand with sporting excellence. Athletes need to be able to train and compete in healthy conditions of clean air and water, and eat healthy diets. Biodiversity is fundamental to functioning ecosystems that provide the environmental conditions conducive to sporting activity. For fans and spectators, environmental quality can affect their experience of attending and watching sports events.

How sports events impact biodiversity

The potential ecological pressures caused by sports events can be classified as follows (Table 1):

- Habitat loss or modification
- Disturbance or damage to wildlife
- Introduction of alien invasive species
- Soil erosion and compaction
- Depletion of water resources
- Pollution
- Climate change and unsustainable sourcing

The benefits of biodiversity to sports events

A healthy natural environment provides several practical benefits to sports events:

- Natural landscapes and vegetation are integral to the look and feel of sports venues and enhance spectator experience.
- Vegetation provides shade and shelter, reduces glare, dust and erosion, filters sound and airborne pollutants and reduces urban heat-island effects.
- Clean rivers, lakes and seas allow water sports to take place without public health risks.
- Sites with a good mix of natural habitats are less vulnerable to pest species that can cause costly damage to playing surfaces.

Furthermore, a healthy environment can reduce risks to human and wildlife health, lower

management costs and potentially increase sponsorship revenue.

Public empathy for wildlife can be a powerful factor for organisers looking for emotional touch points at the opening and closing of sports events. Importantly however, the use of captive or domestic animals in ceremonies and other marketing activities must be done with the utmost sensitivity and respect. It should never be done at the risk to, or conservation interest of these animals.⁸ Under no circumstances should wild animals be used in ceremonies.

How sports events can benefit biodiversity

While avoiding and minimising ecological impacts is an imperative for any responsibly organised sports event, there are many ways sports events can generate positive outcomes for biodiversity. There may be particular threats to nature that also affect the quality of sports (e.g. poor water quality in a natural landscape used for water sports). By addressing these threats, the local environment, host communities and sport could all benefit.

Broadly speaking, there are a number of ways in which sports events can benefit biodiversity, namely by:

- Initiating projects to improve and conserve biodiversity;
- Raising awareness about biodiversity through communication and the media;
- Fundraising and financing relevant conservation initiatives;
- Involving sponsors to bolster conservation and support for biodiversity initiatives; and/or
- Collaborating or forming partnerships with organisations, increasing their capacity to implement conservation activities and foster public awareness of biodiversity.

8 For example, the Japan Sailing Federation (JSF) issued an apology after a captive dolphin show was used at the opening ceremony of a World Cup competition that was also being used as a Tokyo 2020 Test Event. The display sparked widespread criticism, including from athletes. JSF's head conceded that using dolphins showed a 'lack of consideration' amid the ongoing need to protect these mammals and ocean life. <https://www.insidethegames.biz/articles/1069899/japan-sailing-federation-issues-apology-for-dolphin-display-at-tokyo-2020-test-event>

Table 1: Main sources and associated biodiversity impacts from sports events.

Potential sources of impacts	Examples of potential impacts on biodiversity
Habitat loss or modification	
Clearing natural areas for temporary siting of event infrastructure: e.g. overlay, spectator and hospitality areas, broadcasting positions, logistics compounds, parking areas.	Direct loss, fragmentation or modification of natural habitats with associated impacts such as loss of vegetation, reduced areas for breeding, feeding, watering or resting, or interruption of breeding, or loss of access to food or water.
Spectator crowds moving through and/or standing in natural outdoor areas.	Trampling of natural areas, damage to vegetation and habitat, disturbance of wildlife.
Accidental fires.	Direct habitat loss, potentially extending well beyond the confines of the venue.
Behaviour of sports teams and athletes, spectators and contractors.	Unauthorised removal of wild animals or plants, increased fire risk.
Disturbance or damage to wildlife	
Temporary fencing and barriers erected outdoors for the event.	Restricted movement of wild animals, possible collisions and injury.
Installing electric or other cables or wires outdoors.	Collisions and injury, or electrocution of wild animals; accidental death.
Traffic generated by the event (spectators, athletes, logistics, construction or removal of overlay).	Noise and vibration impact on wild animals: behaviour changes, disorientation, disturbance of breeding or nesting. Accidental vehicle strike causing injury or death of wild animals.
Noise from public service announcements or sound systems and cheering crowds.	Noise and vibration impact on wild animals: behaviour changes, disorientation, panic flight, disturbance of breeding or nesting, displacement and accidental collisions with infrastructure.
Noise/vibration from outdoor sports event such as car races.	
Noise from firework displays, ceremonies and other entertainment.	
Outdoor venue lighting.	Disorientation of wild animals, disturbed movement, breeding and feeding patterns. Bright floodlighting can attract large numbers of moths and other flying insects which can disorientate nocturnal birds and bats.
Introduction of alien invasive species	
Athlete and spectator movement outdoors.	Introducing seeds of non-native, invasive species on footwear.
Accidentally releasing alien invasive species through poor biosecurity practices applied to sports equipment and other materials and equipment brought in from outside the venue.	This can occur when sports equipment, clothing and footwear, and other materials such as plants for landscaping are contaminated with seeds, spores, eggs or larvae of non-native invasive species. If they become established, invasive species threaten the survival of native plants and animals by replacing them in the food chain, competing for habitat, eating them or introducing new diseases.
Soil erosion and compaction	
Clearing areas for permanent modification and venue upgrades.	Exposed areas may be subject to soil erosion and higher risk of landslides.
Using heavy vehicles and machinery at the venue in setting up or removing overlay in natural areas, parking outside broadcast units and temporary logistics compounds, and other off-road vehicle activities.	Soil compaction and erosion, impact on drainage systems and tree roots close to the surface, loss of vegetation.

Removing and moving soil in natural areas to prepare sports surfaces.	Loss of soil and the plant and animal communities living in it.
Movement of athletes, workforce and spectators in natural areas.	Soil erosion, particularly along shorelines, riverbanks and steep slopes.
Depletion of water resources	
Irrigating competition surfaces.	Water extraction can alter aquatic ecosystems and habitat for plants and animals.
Extracting water to supply the event.	
Using water for making snow.	Increased sediment movement into downstream water bodies, changing the composition of plant and animal species living in aquatic ecosystems.
Pollution	
Spillage and/or poor containment of fuels, oils, toxic or hazardous chemicals.	Pollution of terrestrial and aquatic habitat/ecosystems and potential death or harm to wildlife.
Sewage leaks or spills.	Can affect downstream areas away from the source.
Poorly controlled use of pesticides, fertilisers or other chemicals on sports surfaces and landscaped areas.	May lead to wildlife death or significant habitat modification through introduction of toxic chemicals, changes in chemical composition or nutrient balance (e.g. leading to algal blooms).
Use of antifouling agents or other toxic chemicals (especially in water sports).	
Use of wastewater, salt, chemicals and dyes in snowmaking.	
Litter left on site and/or blown into neighbouring areas (including from balloon or sky lantern releases).	Death or harm to wildlife by eating waste, suffocation or being smothered by discarded rubbish.
Incorrect or inappropriate disposal of solid waste, e.g. waste sent to landfill sites.	<p>Pollution of terrestrial and aquatic habitat/ecosystems through irresponsible disposal of waste in unlicensed or non-designated waste facilities.</p> <p>Waste sent to poorly controlled landfill sites can impact aquifers and other natural habitat through run-off and releasing pollutants into groundwater, surface water and soils, reducing the suitability of habitat for plants and animals. Gas emissions from landfill also contribute to climate change, indirectly affecting biodiversity.</p>
Climate change and unsustainable sourcing	
Transporting goods and people to and from the event.	Release of greenhouse gases which contribute to climate change with indirect impacts on biodiversity. Impacts of air pollution and emissions on wildlife.
Using non-renewable energy sources at the event.	
Selecting, sourcing and procuring goods, materials and services.	<p>Choice of goods, materials or services known to have negative impacts on biodiversity, or which are not produced or delivered sustainably such as:</p> <ul style="list-style-type: none"> • Single-use plastics • Timber and wood products from unsustainable forestry operations • Food and materials (e.g. cotton) from unsustainable agricultural production • Fish and seafood from unsustainable fisheries • Plant and animal products in contravention of CITES regulations.



HERBALIFE
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PART 1

PART 1. Laying the foundations: planning for the effective management of biodiversity opportunities and impacts

The planning stage of a sport event is crucial in terms of its overall sustainability, both in avoiding and minimising negative impacts during the event and securing long-term benefits for biodiversity conservation. It gives organisers time to understand the environment in which the event will be staged, identify potential biodiversity challenges and opportunities, and incorporate solutions to these challenges during event delivery. By carefully avoiding and minimising potential impacts on biodiversity during event planning, the need for remediation after the event such as restoring damaged habitats, with time and cost implications, can be greatly reduced.

It is assumed here that all responsible event organisers will ensure they comply with legal environmental requirements as a minimum. Compliance is a complex subject and varies greatly according to which jurisdiction the event takes place in; some events are transboundary and cross protected areas.⁹ Local expert advice should always be sought, and this can be from planning authorities, nature conservation agencies or others.

1.1 Concept phase

The concept phase marks the beginning of the event lifecycle and applies to situations where the location, timing, scope, organiser or host of the event are not pre-determined. This includes situations where there is a choice of venue and there may be several bids to host the event. Examples include the Olympic and Paralympic Games, selection of new circuits for Formula 1 Grand Prix, venues for certain golf majors or skiing championships, and new routes for cycling races.

This section does not apply to regular events that take place at the same venue and time of year such as tennis majors, football league matches and certain sailing regattas. Of course, such situations may

Particularly relevant to biodiversity are regulations relating to statutory protected areas, protected species, pollution control and the release/control of invasive alien species.

Beyond legal compliance, a number of actions will help build strong foundations for biodiversity conservation:

- Setting clear goals for the event with regard to biodiversity.
- Choosing venues that avoid or minimise impacts on biodiversity – especially important for outdoor events taking place in the natural environment.
- Planning to deliver the event in a responsible way that minimises biodiversity impacts.
- Working towards continual improvement in repeat sports events over time, and reporting back to stakeholders on biodiversity outcomes.

These considerations and related issues are explained in detail in the following sections.

still present issues and opportunities for biodiversity conservation and these should be addressed during the detailed planning and event delivery phases.

Venue selection

Where there are choices of venue for an outdoor sports event in places with a relatively greater potential to affect biodiversity, it is important to select the most suitable location that avoids or minimises ecological impact.

Avoiding and minimising biodiversity impacts is preferable to restoring or compensating for any damage caused, not just for the sake of ecosystems and

⁹ E.g. Tour de Tuli which crosses South Africa, Zimbabwe and Botswana, one Game Reserve and a National Park. The laws of all three countries as well as the rules applicable to visitors to the protected area must be adhered to.

species but also because the reputational, practical and financial costs of addressing negative impacts can be significant. When habitats are damaged, the impact on biodiversity is usually immediate, while restoring them is a long-term undertaking and less certain to result in the desired outcomes for nature. For this reason, special attention should be paid to

avoiding and minimising impacts on important areas for biodiversity (Box 1, 2, 3 and 4).

In some situations, a new sport development on degraded land (e.g. post-industrial or intensively farmed sites) can be a means of achieving biodiversity gains through the creation of new habitats.

Box 1: Areas of high importance for biodiversity conservation

- a) Internationally recognised areas of global significance for biodiversity, such as UNESCO World Heritage Sites, Ramsar wetlands, core areas of UNESCO Man and the Biosphere Reserves, and Key Biodiversity Areas (Box 2).
- b) Existing protected areas, such as national parks and nature reserves, as well as areas that have been formally proposed by governments to be set aside as protected areas for nature conservation.
- c) Areas that would qualify as Critical Habitat using the criteria set out in the International Finance Corporation standards and World Bank safeguards, including:
 - ecosystems that are highly threatened or unique;
 - habitat of significant importance for endemic or restricted range species, and/or globally highly threatened species (e.g. Critically Endangered or Endangered);
 - habitat supporting globally significant concentrations of migratory or congregatory species; and
 - important wildlife corridors and areas associated with important ecological and evolutionary processes across landscapes (e.g. river corridors, indigenous vegetation corridors across altitudinal or climate gradients).
- d) Areas conserved through Other Effective area-based Conservation Measures – OECM (Box 3).
- e) Indigenous and Community Conserved Areas - ICCAs (Box 4).
- f) Habitat for protected and highly threatened species in terms of national legislation.
- g) Critical ecosystem services areas for the wider public good, e.g. critical catchment areas for water provision, and key areas for controlling erosion (e.g. coastal mangroves).
- h) Areas and/or species that have high social or cultural importance to local communities and on which they may depend for livelihoods, health, or safety, and for which there are few if any acceptable substitutes.

Due to the wide variety of sports and venue types, as well as differing environmental characteristics, there isn't a standardised approach to selecting a venue or site from a biodiversity conservation perspective. It is wise to understand the broader environmental context before committing to a specific site, venue configuration or event concept.

When planning a sport event, the goal should always be to avoid any impact on biodiversity. Choosing a venue with a history of hosting similar events, and with adequate capacity for spectators, is likely to pose a relatively lower risk to biodiversity than new sites close to natural areas. There may well be laws

and regulations in place that prevent an event taking place in or near statutory protected areas.

In practice, the venue or site choice is often pre-determined for sports and logistical reasons, and only well-known existing venues will be suitable. In most cases this is likely to present little risk to biodiversity, but situations can change over time and aspects previously overlooked may become more critical. Therefore, it is always important to check the ecological status of the site, whether there are any sensitive habitats or species occurring within it or close by that would require protection measures, and whether this would impinge on the event's organisation (Box 5).

Box 2: Key Biodiversity Areas

Key Biodiversity Areas (KBAs)¹⁰, sites that contribute significantly to the global persistence of biodiversity, are identified nationally using a Global Standard for the Identification of Key Biodiversity Areas which was adopted by IUCN in 2016, based on consistent application of global criteria with quantitative thresholds. These criteria encompass threatened biodiversity, geographically restricted biodiversity, ecological integrity, biological processes, and irreplaceability. They are applicable to species and ecosystems in terrestrial, inland water, and marine environments.

The KBA Partnership, comprising 12 international conservation partners, has prepared Guidelines on Business and KBAs, covering both project-level and corporate-level guidance (2018). These guidelines prioritise avoidance of impacts on KBAs and early implementation of impact minimisation measures, and highlight that there are limits to the success of restoration and use of offsets.

The business community can play a positive role in conserving KBAs, by supporting the World Database of Key Biodiversity Areas™, sharing biodiversity data collected during project planning and operations, and financing the conservation of KBAs through corporate social responsibility initiatives or offsets within KBAs for residual negative impacts on other project sites.

Screening for biodiversity risks

A screening exercise to identify potential biodiversity risks in and around the proposed venue should be carried out at the concept or bidding stage but should not be seen as a full Environmental Impact Assessment (EIA), which may be needed later. Screening will help ensure that the environmental aspects of the sites have been identified and appropriate ecological survey, impact assessment and mitigation planning are considered. Where more than one site is being considered, the screening exercise will be helpful to compare sites and assess relative levels of risk to biodiversity and other environmental factors. The possible biodiversity impacts that should be screened for are listed in Table 1.

Poor existing environmental conditions such as polluted waterways or contaminated land also need to be considered, balancing the benefits of cleaning up affected areas against additional costs and risks.

While the physical and technical aspects of a site are important in the choice of venue, other factors may have an influence such as local opposition to the event on the grounds of loss of public amenity and environmental impact. Even if there is no official conservation designation, local communities may highly value their green spaces and their concerns must be respected.

By identifying constraints as early as possible in the planning process, workable solutions,

Box 3: Other Effective area-based Conservation Measures (OECMs)

An OECM is an area that is not recognised as a formal protected area and does not necessarily have biodiversity conservation as an explicit management objective. It is governed and managed in ways that achieve conservation of its biodiversity, however, with associated ecosystem services values.

OECMs can be governed under a range of governance types, namely by governments, private individuals and organisations, indigenous peoples and/or local communities, or in combination (shared governance). They are expected to be managed in the long term.

Examples of potential OECMs include privately conserved areas, some Indigenous and Community Conserved Areas (Box 4), some KBAs, some permanently set aside forests, hunting reserves, and sacred natural sites with high biodiversity value.

¹⁰ Chapman and Duffus 2012

¹¹ <http://www.keybiodiversityareas.org/home>

Box 4: Indigenous and Community Conserved Areas

The conservation of ecosystems and species by indigenous peoples and local communities is age-old. However, the idea that these areas may be equivalent to government-managed protected areas has only recently been recognised.

Indigenous and Community Conserved Areas (ICCAs) are natural and/or modified ecosystems containing significant biodiversity values, ecological services, and cultural values. They have three defining characteristics:

- a community that is closely connected to a well-defined ecosystem, species, or habitat, for cultural reasons or because of livelihood dependence or survival;
- the community's management decisions and efforts lead to conservation of biodiversity even when the objective of management (e.g. livelihood or water security, safeguarding spiritual places) may not relate directly to conservation; and
- the community is the major player in decision making and management in the area.

ICCAs are voluntarily conserved by indigenous peoples and local communities through customary laws or other effective means. In many cases, ICCAs are a way of life for communities, with a grounding in history and tradition. ICCAs can include ecosystems with minimum-to-substantial human influence by both sedentary and mobile communities. They can also include cases of continuation, revival, or modification of traditional practices or new initiatives taken up by communities in the face of new threats or opportunities.

or if necessary, alternative sites can be found. Discovering and reacting to problems further down the line is always more costly and risky.

Actions to take:

1. Review available data relevant to the area on important or sensitive biodiversity areas and key species.
2. Consult relevant environmental authorities, local experts and NGOs to determine issues, risks and opportunities from their perspective.
3. Evaluate potential public opposition or concerns about the event.

4. Make sure all legal and regulatory requirements are identified and understood.
5. Conduct a field survey to verify and assess any critical matters arising from actions 1, 2, 3 and 4.
6. Consider alternative venues.
7. Determine requirements for further study.

Other issues potentially impacting biodiversity

While these guidelines focus mainly on the direct physical impacts of sports events on biodiversity, there are wider considerations to address as

Box 5: Protecting important areas for biodiversity – the London 2012 Olympic Games Road Cycle Race¹¹

Road cycling through central and suburban south-west London might not immediately suggest an impact on biodiversity. In fact, some of the most difficult challenges faced by the Organising Committee (LOCOG) regarding nature protection were encountered along the race route. The issues were two-fold: first the potential impact of large numbers of spectators trampling over species-rich, fragile grasslands, impacting the habitat of rare plants and invertebrates. The second was the requirement from broadcasters to cut back roadside tree cover so aerial footage of the race could be captured from helicopters.

Both concerns were resolved. In the first case through close engagement with local and statutory conservation organisations, carrying out detailed ecological surveys and using the information to define specific areas for spectators, and ensuring these were marked and marshalled. On the second issue, LOCOG stood firm and refused to carry out most of the tree works on conservation grounds and ultimately this did not affect the broadcast quality.

the potential impacts can extend well beyond the event's immediate footprint.

Water use

Many sports venues consume large amounts of water, especially those involving maintenance of turf-based playing surfaces or snowmaking for alpine sports which may be over lengthy seasons, or even year-round. Hosting sports events further increases the demand for water, both to cater for the people attending and to produce the best playing surfaces.

Freshwater extraction is already a challenge for many regions.¹² In water-stressed environments, with many competing demands, water consumption for sports grounds and events can be controversial. There have already been high-profile cases of legal restrictions on water use for sports activities resulting in events being cancelled or moved to other locations (Box 6).

Water stress also has a major impact on biodiversity. The additional demand for water from sports events can temporarily affect local freshwater ecosystems, either lowering water levels or drying out wetlands. This may affect the wider water catchment, not just the venue's immediate surroundings.

Actions to take:

1. Avoid choosing locations and times of the year for an event that would aggravate constraints on available water supplies, particularly in water-stressed or arid areas.

2. Choose existing venues that use water efficiently.

Solid and liquid waste

Waste management is a major challenge during sports events of all types and in all venues. Waste includes everything from sewage to plastic packaging, discarded food to sports equipment. Depending on the disposal method, waste can have major impacts on wildlife populations, particularly where it gets into food chains or pollutes natural areas. It is therefore important to ensure that the venue has the capacity to manage and dispose of waste in a way that does not harm biodiversity.

Actions to take:

1. Choose a venue that has access to recycling facilities, to avoid landfill and/or waste incineration.
2. Give preference to a venue that has access to composting facilities for biodegradable waste.
3. Where the sports event has the potential to pollute water systems, select venues that are either away from water bodies or wetlands, or have effective safeguards in place.

Transport and energy use

Climate change is one of the key drivers of biodiversity loss with changing weather patterns modifying habitats to the extent that less adaptable species are at risk. Prolonged droughts, major storm events – increasingly unseasonal – and flooding are

Box 6: Example of a major sports event being impacted by water shortages

In 2016 the High Court in Mumbai ordered several Indian Premier League (IPL) cricket matches to be moved due to drought conditions and restrictions on water use in the state of Maharashtra. Parts of the region were enduring one of the worst droughts for over 100 years and there was growing public concern over the lack of water in many parts of the state following two successive years of drought and crop failures. The court dismissed arguments that treated sewage could be used to prepare pitches.

The decision meant 13 matches scheduled to be held in the cities of Mumbai, Pune and Nagpur had to be moved. Although the IPL attracts some of the world's top players and is one of the richest cricket leagues in the world, this case shows that despite wealth and popularity, even top-level professional sport can be at the mercy of changing weather patterns due to climate change.¹³

12 <https://www.eea.europa.eu/themes/water/water-resources/impacts-due-to-over-abstraction>

13 <http://sport360.com/article/cricket/ipl/174819/court-orders-ipl-to-move-matches-due-to-maharashtra-drought>

all having serious impacts while some invasive species are extending beyond their natural range and affecting native species.

Sports events contribute to climate change primarily through the greenhouse gas emissions associated with transport, from people travelling to and from events, supply chain logistics, and energy use at venues (Box 7 and Figure 2).

Actions to take:

1. Choose venues with good access to public transport systems.
2. Give preference to venues that use renewable energy sources.
3. Select venues that have accommodation close by which is on public transport routes.
4. Give preference to venues accessible via pedestrian or cycle routes, and provide incentives for using non-motorised transport.
5. Choose venues that prioritise the use of local goods and services during the event.

Defining the scope of the event

When developing the event concept, it is important to think about everything that is involved in delivering the event and how much is under the control of the event owner or organiser. Some sports events can attract peripheral activities that may not be under the control of the main organisers (e.g. camping areas and entertainment activities) which could have

significant impacts on surrounding areas and bring in more people and materials.

The scale of the event should fit the infrastructure and resources available, without requiring extensive modifications that could damage natural habitats and increase the demand for water and energy.

Actions to take:

1. Be clear about the size of the event, the activities envisaged and what space they require, so that the most appropriate venues can be chosen with the least risk to biodiversity.
2. Scale the event to what can be accommodated at the venue without requiring disruptive modifications that could impact biodiversity – or avoid venues that are too small for the event’s needs.

Timing of the event

Biodiversity is greatly affected by seasonal changes so sites that are important to nature conservation might only be affected by sports events at certain times of year. Provided the habitat quality remains unaffected, it may be possible to stage an event during the ‘off season’. For example, sports taking place in summer on open water sites that are habitat for wintering wildfowl are less likely to pose a significant risk. Similarly, there may be less disturbance caused by land-based sports events occurring after the breeding season for birds and other wildlife. However, it is not simply a question of when the

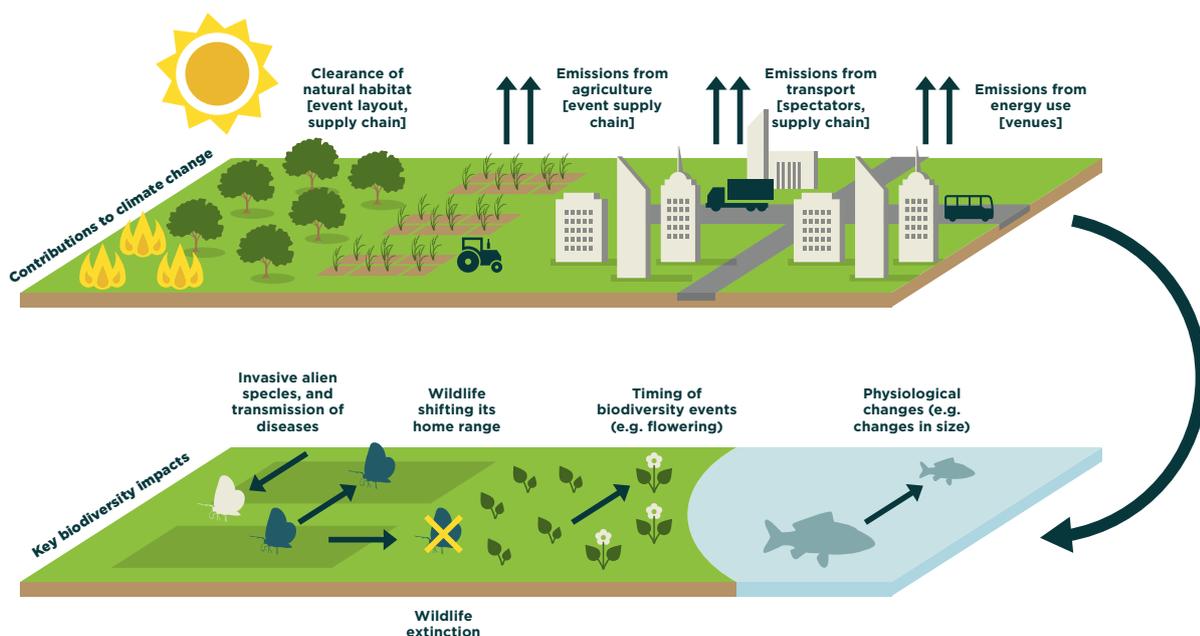


Figure 2: The links between sports events, climate change effects, and impacts on biodiversity

Box 7: Carbon footprints of sports events

A number of large sports events have committed to minimise carbon emissions and simultaneously reduce biodiversity impacts:

- The Alpine World Ski Championships held in Åre in 2019 aimed to make this competition the first climate-neutral Alpine World Ski Championships. Using solar panels, electric vehicles, battery storage facilities and charging infrastructure, it was expected that two-thirds of all energy and fuel use would be fossil free, and these actions were estimated to save 1,000 tonnes of carbon dioxide equivalent.¹⁴
- The German Football Association's sustainability strategy for the 2024 UEFA European Football Championship¹⁵ includes waymarked routes known as 'fan miles' which will enable fans to reach the stadiums easily on foot or by eco-friendly public transport. Bike-sharing stations will also be set up for staff at the stadiums. The goal is to make public transport more appealing to fans, not only for travel to Germany but also to cover the long distances between venues. The strategy includes measures such as secure cycle storage and alternative shuttle services to enhance the sustainability of mobility during the event.

event is held. If it is preceded by a lengthy set-up period involving the installation of overlay and other infrastructure, this could coincide with critical periods for wildlife such as the breeding season for birds.

It is important to consider how an event might affect biodiversity at other times of year, not just during the event delivery period. Winter sports in alpine regions are less likely to affect wildlife directly during winter as many species move to lower altitudes but the activities may modify habitats below the snow that could affect species using the area in spring and summer.

Actions to take:

1. Understand the year-round context of the venue and local area with regard to biodiversity and the risk of ecological impacts beyond the event delivery.
2. Ensure event delivery phases avoid peak periods of ecological sensitivity such as breeding, nesting or moulting seasons.

Bidding for an event

Not all sports events go through a bidding process, but the principles outlined here are also relevant when selecting host venues through other means.

The concept of sustainability has become an essential part of the bidding process for many major sports events and bid requirements are becoming more sophisticated and detailed with respect to environmental issues, including biodiversity conservation. More and more event organisers recognise the need to deliver environmentally and socially responsible events that leave lasting benefits. The time to establish sustainability requirements is right at the beginning when developing the concept for the event or launching a bidding process.

The event owner and the bidder have different but complementary opportunities to integrate biodiversity elements in the bidding process.

Event owner's perspective

It is the responsibility of the event owner, or owners (where there are multiple parties controlling the event), to set the parameters for the bidding process. This is the opportunity to make it clear that biodiversity issues are a major consideration in how prospective host candidates will be evaluated. In many respects this is just a special form of procurement in which the principles of sustainable sourcing should be applied.

14 <https://www.insidethegames.biz/articles/1051891/are-2019-pledge-to-deliver-fossil-fuel-free-alpine-world-ski-championships>

15 <http://www.sonnenseite.com/en/environment/sustainability-strategy-for-euro-2024-shows-that-environmentally-friendly-sports-events-are-possible.html>

Actions to take:

1. When launching the bidding process, emphasise the importance of sustainability in the project requirements and include specific reference to biodiversity conservation.
2. Include clear and specific questions and guidance on biodiversity requirements in candidate questionnaires and other related documentation.
3. Include provision for an initial environmental screening report on the venues being proposed.
4. Where a choice of venue is available, ask applicants to consider alternative options as part of their venue selection process and to justify their proposal according to biodiversity criteria among others.
5. Ensure that ecologists or other relevant experts help evaluate bid submissions.
6. In cases where there are potential concerns about impacts on important areas for biodiversity, engage with the relevant authorities and local conservation organisations.
7. Stipulate a requirement for monitoring and reporting to ensure that commitments are properly implemented during and after the event.

The bidder's perspective

In many respects, the applicant's perspective mirrors that of the event owner. Wherever the event owner highlights the importance of sustainability and requires specific issues to be addressed, the applicant must respond in detail.

This means demonstrating a good understanding of the biodiversity attributes and possibly carrying out some initial environmental studies on the venue being proposed.

While there are likely to be other factors in selecting the winning bid, failure to pay sufficient attention to biodiversity issues puts applicants at a disadvantage. Conversely, a strong submission on biodiversity, including detailed information on the local environment, helps demonstrate commitment, competence and an appreciation of risk.

Applicants can be proactive in showing that environmental risks such as a venue's proximity to natural or cultural protected areas, and concerns about disturbance to wildlife or pollution of water bodies

have all been factored into their bid plans and comply with legal requirements and best practice.

Applicants may also gain an advantage by demonstrating how a sustainably managed event would be more attractive in terms of participant experience, cost-effectiveness, relations with the host community, and possibly more attractive to sponsors.

Actions to take:

The following biodiversity criteria could be incorporated into bid documentation.

1. For outdoor events in natural or purposely modified landscapes:
 - a. Explain what measures will be undertaken to avoid or minimise potential impacts on species or important habitats for biodiversity. Include information on any species, habitats, ecosystems and areas of conservation importance in and around a venue, including its proximity to protected areas.
 - b. Explain how the outdoor layout of the venue will take into account important areas for biodiversity.
 - c. Explain how modification of any natural habitat will be minimised, particularly where that habitat may be difficult to restore or take a long time to recover after the event.
2. Show how all relevant laws and policies on biodiversity applicable in a venue's area (e.g. policies of the venue itself, the town or city, regional or national government) will be complied with.
3. Indicate whether a commitment has been made to a sustainability policy that includes biodiversity goals, or a specific policy on biodiversity.
4. Indicate how biodiversity goals will be achieved and verified.
5. Make a commitment to sustainable sourcing practices to minimise both direct and indirect impacts on biodiversity.
6. Commit to efficient use of water and energy (preferably avoiding fossil fuel use and minimising the event's greenhouse gas emissions), given the potentially significant indirect impacts on biodiversity.
7. Make a commitment to reduce waste and ensure its disposal in a way that minimises biodiversity impacts.
8. Describe what measures will be implemented to create long-term benefits for biodiversity.

1.2 Strategic planning

Strategic planning is the critical first stage for all events. Irrespective of whether or not this has been preceded by a bidding process or other form of site selection, or if the event is a regular fixture, all event organisers need to be clear about what they are trying to achieve.

At this stage the known elements are the location and time of the event and its purpose (i.e. the type of sport and level of the event – world/national/regional championship). In most cases, the size of the event in terms of number of teams, athletes and spectators will also be known – at least approximately – and the event owners and organisers identified.

Matters still to be decided include the event's broader aims and objectives, who does what, which other stakeholders should be involved, what policies there will be on issues such as human rights and working conditions, community engagement, diversity and inclusion, and – of course – environmental protection.

All of these issues can and should be incorporated into a holistic sustainability strategy for the event. Although these guidelines focus on biodiversity issues, biodiversity should not be seen as a separate theme. Any responsibly managed sports event will address sustainability as an overarching theme, within which there will be a range of material issues, including biodiversity.

Organisational governance and leadership

Responsibility and accountability for biodiversity matters in the planning and delivery of an event should be addressed through governance – the structures and processes through which decisions are made.

Established, regular events will generally have governance mapped out but there should always be scope for review as circumstances change – political, legal, societal expectations, financial, contractual and so on. It should be clear how biodiversity and wider sustainability considerations fit into the governance structure and the arrangements made should be suitable for the longer term.

In this respect strong leadership is key, making an explicit commitment to support biodiversity conservation and recognising its relevance and importance to sports events. Leadership can be shown on many fronts including by the event owners or organisers, venue owners and operators, and in some cases sports teams and public authorities. Broadcasters and sponsors can be highly influential, so they too need to be incorporated into the governance structure and actively engaged in biodiversity issues.

Key aspects to determine are:

- Who has overall control – who makes decisions?
- Which stakeholders are involved in or affected by the event?
- Which stakeholders have delivery or contractual responsibilities and which ones can be influenced but are not under any form of control?

Based on the answers to these questions, it should be possible to establish an effective governance structure and identify where sustainability matters fit.

For larger sports events involving multiple delivery partners, it is useful to create a sustainability steering group, bringing all the key actors together to discuss how to achieve biodiversity objectives. This can help ensure responsible project management. Wider engagement with external parties such as environmental agencies, conservation NGOs and local experts should also be considered. Depending on the circumstances, these may be bilateral engagements, grouped into some form of advisory group or stakeholder forum.

It is also essential to define individual responsibilities for biodiversity within the governance structure, which will depend on the size and scope of the event and the organisations involved. This could range from having a nominated 'champion' who takes day-to-day responsibility for biodiversity matters, supported by volunteers and local experts, to a fully professional structure with an in-house sustainability team in one or more of the delivery partners.

The right governance arrangement may not always be obvious and could require initial work to scope out the various tasks related to biodiversity and identify the most appropriate organisational structure to match these, as well as the resources, knowledge and skills required.

Actions to take:

1. State the leadership commitment to sustainability and biodiversity conservation.
2. Confirm the organisational structure for planning and delivering the event including relationships with other delivery partners and relevant external entities.
3. Identify internal and external responsibilities for sustainability and biodiversity.
4. Identify all relevant stakeholders and determine where and how they should be engaged.

Setting a policy and objectives for biodiversity conservation

It is important to be clear from the outset why a biodiversity policy is needed and what it aims to achieve. Often, organisations embark on a biodiversity strategy because they feel it is important but are not clear on what is involved or how it relates to their central purpose.

Biodiversity conservation, just like all other sustainability issues, needs to be defined as part of an organisation's overall strategy in terms of helping to deliver a high-quality sports event. Consider how a commitment to biodiversity conservation will help build relations with public authorities and local communities; attract new sponsors and events; improve efficiency and help manage resources better. All these benefits can be gained by adopting sustainability as a working principle, but this requires concerted planning.

To recognise biodiversity as a key issue and adopt it as part of a sustainability approach, it needs to be integral to the organisation's long-term ambitions. It should not be treated as a separate, unconnected entity, not least because this could create greater reputational risk.

This is why setting a clear vision for an event and defining policy objectives that can be signed-off by all decision makers is so important, securing biodiversity conservation at the start of event planning as a shared priority (Box 8).

Examples of biodiversity objectives for sports events include:

- Avoid impacts on important areas for biodiversity.
- Avoid impacts on the habitats of threatened or protected species.
- Avoid harm to ecosystems and species, directly or indirectly, from water use.
- Avoid the introduction of alien and invasive organisms or pathogens.
- Minimise damage to all natural ecosystems and habitats.
- Restore or repair any damaged areas as soon as possible after the event.
- Improve the ecological condition of areas within or close to the venue to generate long-term benefits for biodiversity.
- Use the power of sport to promote biodiversity conservation.

Actions to take:

1. Define an overarching sustainability policy for the event with explicit, high-level goals for biodiversity conservation that guide all subsequent decisions and planning including procurement.
2. Communicate the policy to all stakeholder groups, internal and external, and seek their feedback on which issues they consider most important (known as a materiality assessment).
3. Use the materiality assessment to inform specific objectives, targets and actions to support biodiversity conservation.
4. Communicate these objectives, targets and related requirements to all partners, sponsors and service providers involved in the event.

Establishing a management system

All organisations have some form of management system, even if it is not formally recognised as one. It is important to decide how biodiversity matters

Box 8: Examples of biodiversity-related objectives in international sports events¹⁶

1. In 2017, the Minister of Sport and WWF France¹⁷ launched a Charter of 15 'eco-responsible' objectives in the setting up of these events, during the events, and in their dismantling. Twenty signatory organisations in France alone, including Roland Garros, Tour de France, and organisers of a number of world championship events, have committed to these objectives.¹⁸ Other organisations including the Ryder Cup¹⁹ have followed their example; to date nearly 70 event organisers and facility managers, representing nearly 270 international and national events, are among the signatories. Of relevance to these guidelines, the objectives include:
 - 100% respect for natural sites: no permanent damage to be caused;
 - 100% of energy and water consumption controlled and optimised;
 - A minimum of 50% sustainable food;
 - A 25% reduction in waste and 60% of waste reused, recycled or recovered;
 - At least one commitment given to supporting a good cause;
 - At least one initiative or plan for raising awareness regarding sustainable development; and
 - A minimum of 80% of journeys made using active mobility, public transport or car sharing.
2. The Golf Environment Organisation (GEO) Foundation promotes sustainable golfing events worldwide with objectives including 'fostering nature, conserving resources, and benefitting community'.²⁰ The GEO's Golf Tournament Voluntary Sustainability Standard contains aspirations to protect existing wildlife areas, reduce impacts from temporary infrastructure, and to enhance wildlife areas in some cases.

will be factored into day-to-day business processes to ensure the objectives are achieved.

Best practice, in business generally as well as in relation to organising sports events, has moved from ad hoc issues management to an integrated systems approach to management. A good management system should cover the following elements:

- Vision, values and policy
- Understanding the context of the organisation and its scope of work
- Identifying stakeholders and understanding their needs and expectations
- Determining roles and responsibilities
- Identifying legal and other obligations
- Determining material issues, risks and opportunities
- Setting biodiversity objectives and targets
- Providing adequate resources: people, tools, knowledge and funds
- Defining and implementing operational procedures on the ground
- Managing the supply chain

- Establishing monitoring and measuring protocols
- Putting in place procedures for dealing with incidents and unforeseen changes
- Performance evaluation, review and reporting mechanisms
- Continual improvement

Organisers and delivery partners of larger sports events are increasingly adopting procedures in accordance with recognised international management systems. The most appropriate one in the context of biodiversity and sustainability is the international standard ISO 20121:2012 Event Sustainability Management Systems with Guidance for Use. This is a tool specifically for the event sector (sport, cultural and business events) that allows an organisation to embed sustainability principles and practices into its corporate policies and procedures. The standard itself does not specify biodiversity as a material issue, or define what specific measures to adopt, but provides a framework for organisations to identify material issues and establish appropriate policies and procedures to address them.

16 <https://www.paris2018.com/wp-content/uploads/2017/02/15-Environmentally-responsible-commitments-charter.pdf>

17 <https://www.gouvernement.fr/en/charter-of-eco-responsible-commitments-for-major-sporting-events-in-france>

18 <https://www.gouvernement.fr/en/france-s-top-20-international-sporting-events-commit-to-the-environment>

19 <https://sportsustainabilityjournal.com/news/ryder-cup-2018-commits-to-french-sustainable-events-charter/>

20 <https://sustainable.golf/>

ISO 20121 is a certifiable management system standard. Several sports event organisations, venues and major suppliers to sports events have already achieved third party ISO 20121 certification. This proves that these organisations are taking sustainability seriously and enhances their reputation among stakeholders. Examples of sports event organisations that have achieved certification to ISO 20121 and for which biodiversity is a material issue include:

- Olympic and Paralympic Organising Committees: London 2012, Rio 2016, Tokyo 2020
- Commonwealth Games: Glasgow 2014, Gold Coast 2018
- French Tennis Federation – Roland Garros
- Volvo Ocean Race 2018
- Team Ben Ainslie Racing (Land Rover – BAR), Americas Cup
- Formula E, 2018
- Manchester United, UK
- Croke Park Stadium, Ireland
- World Sailing – Sustainability Agenda 2030
- FIS Alpine World Ski Championships, Åre, 2019

Actions to take:

1. Adopt a systems approach to management to help integrate biodiversity issues into event organisation.
2. Define the scope of the management system and the issues it will cover based on the results of a materiality assessment and agreed policy objectives.
3. Follow the ISO 20121 standard and aim to achieve third party certification.

Assessing biodiversity impacts

If there has been a bidding process or other form of venue selection process, there should already have been an initial screening of potential biodiversity and related issues and risks. If not, the strategic planning phase is the time to do such a baseline study.

The principal aim of this study is to understand biodiversity and other environmental attributes of the venue and use this to determine priority follow-up actions. The next step is to analyse the information against the overall plan for the sports event to identify any potential conflicts between event delivery

and biodiversity conservation. If done at the earliest planning stages it should be possible to avoid or resolve any significant conflicts, whether in terms of physical modifications to the site, or changes to event operations to avoid disturbing sensitive vegetation and wild animals.

When the risk of potential ecological impacts is unresolved, it will be necessary to conduct a more detailed investigation, potentially in the form of a formal Environmental Impact Assessment (EIA). While in planning terms the scope of an EIA will be determined by public authorities, from the perspective of biodiversity conservation, a best practice approach should cover direct, indirect and cumulative impacts on:

- protected areas or other ecologically valuable habitats
- threatened and/or protected species (loss of habitat, disturbance, accidental death)
- surface water and groundwater (e.g. water consumption, discharge of pollutants)
- biodiversity of significant value to people such as for health, natural resource use and cultural heritage

Several organisations offer guidance on ecological impact assessments including the Chartered Institute of Ecology and Management (Box 9).

The assessment should not only look at biodiversity impacts. Event organisers need to understand how ecological constraints could affect the delivery of the event including:

- limitations on field-of-play configuration (avoiding sensitive areas)
- limitations on timing of the event (hours of operation, including set-up period)
- limitations on numbers of spectators allowed at the venue
- additional requirements for pollution and erosion control

These considerations will be most relevant to events in new venues and those taking place in or near natural or semi-natural areas. However, situations can change (environmental conditions, regulatory controls, public opinion etc.) so even for established events it is worthwhile for organisers to carry out such assessments and review their policies on a regular basis.

Box 9: Ecological standards

The UK's Chartered Institute of Ecology and Environmental Management (CIEEM)²¹ has published a series of best practice guidelines aimed at improving the professional quality of field surveys, impact assessments and report writing:

- Guidelines on Ecological Report Writing
- Guidelines on Preliminary Ecological Appraisal, second edition
- Guidelines on Ecological Impact Assessment
- Guidelines for Accessing and Using Biodiversity Data

The institute also refers ecologists in the UK to the British standard BS42020: Biodiversity – Code of Practice for Planning and Development.

Actions to take:

1. Carry out an initial screening exercise to provide baseline information on biodiversity constraints, risks and opportunities.
2. Ensure this covers a review of relevant legal obligations related to environmental protection and nature conservation.
3. Use this information to determine priority objectives and actions.
4. Where potential ecological and other environmental impacts are still likely to be significant, undertake a more detailed Environmental Impact Assessment with specific attention to biodiversity conservation.

Post-event planning

Although detailed planning focusses on preparing for the event, it is also important to anticipate – and ideally avoid – the need for ecological restoration works after the event. These may be factored into venue use agreements with significant penalties attached.

The aim of restoration is to ensure that the area is returned to at least the same ecological condition as before the event. Approaches to restoration will depend on the type of ecosystem and physical conditions. In the case of habitats that recover quickly, it may be enough to protect a damaged area from further impacts and allow it to recover naturally.

Other cases may require longer-term restoration. This could be expensive and difficult to agree contractually, hence the importance of avoiding negative impacts in the first place. In some cases,

particularly where the same venue is used repeatedly for an event, it would make sense to establish a plant nursery and collect seeds of local native plants to help restore areas affected by the sports event.

It is also important to evaluate potential opportunities that could be pursued to support biodiversity conservation.

Actions to take:

1. Establish partnerships with local conservation organisations.
2. Manage habitats within or close to the venue to improve their conservation value.
3. Target conservation action to favour particular species.
4. Identify local 'flagship' species to highlight in promotional material and educational projects.
5. Anticipate potential implications of any post-event ecological restoration work and put in place measures to minimise this risk.

Stakeholder engagement

Given increasing societal expectations on transparency, corporate governance and sustainability, it is essential for any responsible organisation to pay attention to the views and interests of stakeholders.

For organisers of sports events, biodiversity is often a matter of concern to local people and organisations who may have questions about restricting access to natural areas and potential impacts on particular habitats or species. These areas or species may not have statutory protection,

²¹ <https://cieem.net>

meaning that the event organisers are not legally obliged to address the concerns but not doing so can generate negative publicity for the event. In any case, it is hoped the organisers would take a proactive approach to engaging in local nature conservation interests and develop relationships that lead to conservation benefits. Established sports venues should already have information on local biodiversity and relationships with relevant groups, but for new sites and events taking place in open country, information on local ecology and nature conservation will need to be gathered and new relationships developed.

Of course stakeholder engagement is a broad topic covering a wide variety of interests, of which biodiversity is just one. While biodiversity may not always be a top priority for a sports event, it should never be ignored. Even in dense urban areas there can be opportunities to act positively for biodiversity and build effective partnerships with local organisations. Other stakeholders including sponsors, local authorities and internal staff and volunteers may be motivated by being part of conservation action.

Actions to take:

1. Make it an early priority to map out all stakeholders involved in or potentially affected by the staging of a sport event and engage with them.
2. Seek to understand the specific concerns and interests of stakeholders and look for collaboration opportunities.
3. Carry out thorough due diligence to understand an issue raised, verify its relevance and work with local groups, businesses and communities to avoid, minimise and mitigate potential impacts. Be transparent and report publicly on progress.
4. Identify potential partnerships or opportunities to collaborate with conservation organisations in the host area, both for the event period and longer term.

Communications

Communicating on sustainability issues in relation to sports events can be challenging. Usually it is done in relation to specific initiatives, which can seem unconnected to the event, or be perceived as tokenistic, or greenwashing. Nevertheless,

with growing stakeholder expectations that sports events are managed in an environmentally responsible way, it is essential to have a clearly defined strategy for communicating and engaging on sustainability topics.

Although the main opportunity to implement the communications strategy will normally be in the event delivery phase, it is important to prepare the ground carefully and make communication a strategic planning priority. Initial plans should prioritise knowledgeable audiences, such as public agencies and environmental groups, as well as local communities, which are usually the most critical and difficult groups to win over. Wider public communications are better later on in the programme, once the core credibility has been established with these key groups.

Biodiversity can be a highly technical subject, so it is important to check facts before releasing communication materials. Well-intended initiatives can easily be undermined by using photos of the wrong species, or other technical inaccuracies. Likewise, any exploitation or cruelty in showcasing captive or wild animals would not simply be wrong or illegal, but could greatly damage the reputation of the event in question and its organising bodies.

Actions to take:

1. Prepare a sustainability communications plan to map out key topics, opportunities and communication channels.
2. Develop ways to raise awareness and support for biodiversity conservation appropriate to the event's audience and their level of interaction with nature.
3. Anticipate potential negative stories and be prepared with credible responses.
4. Consider the use of sustainability reporting as a further engagement tool and for knowledge transfer.
5. Share ecological data with local conservation groups.
6. Build on or expand existing sports organisation initiatives for the public good, to include biodiversity conservation.
7. Encourage event sponsors that are committed to sustainability to support biodiversity conservation.

1.3 Detailed planning

Once the strategic planning of governance, policy, management, engagement and communications has been developed sufficiently, the focus can turn to more detailed planning of the event. Initial environmental screening may have highlighted potential risks to biodiversity that require further study in parallel with more detailed planning and design of the event infrastructure. Full Environmental Impact Assessments are rarely needed for sports events unless they involve major construction work, or are taking place in a highly sensitive protected area. More often there can be specific concerns – a rare species or area of special vegetation that requires measures to ensure it is properly protected during the event.

Venue design and layout

Biodiversity considerations during this stage will focus on:

- Ensuring event infrastructure is not sited in ecologically sensitive areas or likely to affect nearby sensitive areas such as wetlands.
- Ensuring that construction logistics (e.g. haulage routes, tracks, cable laying, equipment storage and spoil heaps) do not impact on ecologically sensitive areas.
- Ensuring spectator routes, viewing areas and crowd flows do not impact on ecologically sensitive areas.
- Ensuring adequate safeguards are put in place to minimise the risk of pollution through leaks and spillages.
- Optimising the size and space of event overlay to minimise the amount of land and materials used.
- Reviewing potential impacts of off-site facilities related to the event – e.g. training grounds, live sites, transport and logistic depots.

For each of these there should be close dialogue between venue and overlay designers, the event organisers and biodiversity specialists – the in-house sustainability team or local environmental experts. It may also be necessary to engage with statutory agencies and other public authorities if there are critical biodiversity or other environmental concerns. This process can be very simple for repeat events at established venues where

procedures have been refined over several years, to complex and time consuming for new sites that have not previously held sports events, or not at the scale anticipated.

Actions to take:

1. Ensure close collaboration between design teams, event organisers and biodiversity experts during the detailed planning and design of event overlay and services.
2. Consult with relevant statutory authorities on protected habitats and species, water abstraction requirements, fire risk and nuisance issues (noise, light, dust etc.).
3. Capture all remaining risks to biodiversity and ensure these are fed into detailed operational planning and workforce training.
4. Plan the location and timing of construction and set-up activities to avoid critical areas and periods for biodiversity (e.g. fragile habitats or breeding season) where feasible.
5. Make provision for potential restoration works after the event should there be any damage to wildlife habitats.

Sourcing

The sourcing of goods and services for sports events is one of the most tangible ways organisers can implement sustainability policies and minimise environmental impacts, for any sport and any type of venue. Everything that is used for an event has to be bought, rented, donated or borrowed. For any large event this can amount to a considerable volume of products and services.

In practical terms, sourcing is a conduit through which everything has to pass. Organisers have to decide what they need, how much of it, when, for how long and what to do with everything that is left over afterwards. This then has to tie in with the event's budget.

Overlaying this process with sustainability requirements can control quantities, quality and origin of products and take into account other critical factors such as environmental impact and supply chain ethics. The International Olympic Committee's guide on *Sustainable Sourcing in Sport* as part of

its Sustainability Essentials series²² provides general information on sourcing policies, processes and managing supply chain issues.

How sourcing relates to biodiversity

With regard to biodiversity, the potential impacts of sourcing decisions will mostly be felt far beyond the venue of a sports event but are nonetheless important to consider. Broadly, there are three types of impact to be aware of:

- Products causing greenhouse gas emissions that exacerbate climate change.
- Products that pollute the environment either through manufacture, accidents in operation or by becoming waste e.g. plastics.

- Products directly damaging natural ecosystems because they rely on over-exploitation of natural resources such as through deforestation, mining or intensive agriculture and fisheries.

The types of impact, examples of the affected product categories and potential solutions are outlined in more detail in Table 2.

It is important to address these issues in the key operational areas of event organisation. Priority products and services will include:

- Venue and overlay construction
 - Aggregates, concrete and road surfaces with high recycled content
 - Certified sustainable timber (e.g. FSC)

Table 2: Links between sourcing and biodiversity

Potential impacts	Product categories affected	Possible actions to take
Damage to natural ecosystems	Minerals, aggregates, timber, products from intensive agriculture and unsustainable fisheries, peat-based composts	Give preference to certified eco-friendly and sustainably produced natural products
Impacts on threatened species	Products of animal origin Products of plant origin Products from deforestation	Ensure compliance with CITES regulations. Use sustainably certified fish and seafood, meat, palm oil, timber, cotton etc.
Pollution in manufacture	Chemicals and plastic goods, fuels, products from intensive agriculture, cement and metals	Seek lower impact alternatives: e.g. products with high recycled content, or sustainably harvested materials of natural origin, such as timber, thatch, bamboo etc.
Pollution in operation (spills, leaks)	Generators, fuels, cooling systems, cleaning products	Avoid using diesel-fuelled generators, select low GWP coolants, non-toxic cleaning products
Creation of litter and waste	Balloons, carrier bags, single-use plastic products and packaging, sky lanterns, fireworks, printed materials, fliers and giveaways. All surplus materials after the event	Avoid single-use plastic goods, balloon and sky lantern releases; reconsider use of fireworks; plan for asset disposal to minimise waste materials; ask sponsors not to hand out giveaways that are likely to end up as litter
Greenhouse gas emissions from product manufacture	Construction materials (e.g. cement, minerals, steel), intensive agriculture, especially meat and dairy	Source products with high recycled content, plant-based food and natural materials rather than manufactured ones
Greenhouse gas emissions from transporting goods	All	Source products that are produced locally
Greenhouse gas emissions in operation	Equipment, appliances, vehicles; heating, ventilation and air conditioning systems	Seek zero/low emission and energy-efficient alternatives

²² https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/What-We-Do/celebrate-olympic-games/Sustainability/sustainability-essentials/SUSTAINABILITY-ESSENTIALS-ISSUE-3-final.pdf#_ga=2.38569699.1308155641.1566146623-128999281.1566146623

- PVC-free banners and fence scrim
- Rental modular units (cabins, tents, stands) rather than bespoke
- Peat-free composts for landscape planting
- Low GWP coolants
- Energy
 - Green energy sources
 - Temporary power generators
 - Low energy appliances and lighting
- Catering
 - Meat-free alternatives
 - Food from certified sustainable sources (e.g. organic, MSC-certified fish and seafood)
 - Compostable or reusable/recyclable food packaging and consumables (plates, cups, cutlery) depending on local waste processing facilities
 - No single-use plastics (straws, cups, bottles etc.)
- Retail
 - No single-use plastics (including bags and drinking straws)
 - Alternatives to plastic packaging
 - No products from endangered animals or plants
 - Ranges of natural, local and artisanal products
- Clothing/uniforms
 - Sustainably produced and certified cotton items (e.g. BCI certified)
- Cleaning and waste
 - Non-toxic, biodegradable cleaning products

There are many other examples that need to be addressed on a case-by-case basis according to circumstances. Essentially, event organisers should pay close attention to product and material selection, sourcing and supply chain management as part of their sustainability programmes. Many product categories and purchasing decisions have implications for biodiversity.

Sports events have the added complexity beyond conventional supply chain management in that many goods and services come through sponsorship, many events also have licensees, and it is common for certain sports to have sole

supplier arrangements for specialist equipment. If using established sports venues, there are likely to be incumbent service suppliers such as caterers, cleaners and retail operators.

Natural products and use of certification schemes

Voluntary sustainability standards and certification schemes for products can be an opportunity to go beyond minimum industry and regulatory standards and develop greater public confidence in an event organisation's approach to sustainability.

There are many sustainability certification schemes covering a wide range of environmental, social, animal welfare, labour standards and other ethical criteria in sectors such as timber and timber products, food, clothing, minerals and electronic components.

Some sustainability certification schemes are country- or region-specific while others are more widely available. In some categories, there may be more than one standard or certification scheme to choose from, and in some cases it is possible to have dual certification.

However, no certification or product-labelling scheme is perfect, and most will prioritise certain issues over others. There can also be perverse effects from insisting on certified products if this denies opportunities to local, small-scale suppliers. This is again a reason why event organisers need to have a clear strategy, prepare early and work with suppliers and partners to find the most appropriate solutions.

Recommendations for sourcing requirements:

- Use natural resources that are harvested sustainably, preferably certified as such, and from local areas where possible. Select contractors who use locally sourced materials and products.
- Ensure that the origin of natural goods or materials sourced by service providers and the way they have been acquired or harvested is clearly documented and traceable.
- Never use materials from plants or animals on the [IUCN Red List of Threatened Species](#) or any species covered under [CITES Appendix 1, 2 and 3](#).

- Stipulate in all contracts that sourcing natural materials is to be undertaken strictly in accordance with applicable laws and international conventions, and that the supply of plant and animal products must not involve poaching or illegal removal of wild animals or plants.
- Avoid the use of materials or products from threatened plant or animal species or from environmentally sensitive regions, e.g. limit the use of tropical hardwoods and virgin wood (Box 10).

Sourcing of chemical and degradable products

Natural ecosystems are sensitive to chemical pollution and even small spills into water bodies can cause serious contamination. All chemical products procured (for cleaning, grounds management, cooling systems etc.) must be legal. As standards vary across the world, organisers of international sports events should try to apply a high level of compliance that may exceed local regulations. This would include avoiding chemicals identified by scientific bodies or others as harmful to the environment and wildlife.

Sourcing requirements should include the following criteria:

- Avoid the use of, or contain substances included in Annex XIV of the EU Registration, Evaluation, Authorisation and Restriction of

Chemicals (REACH) Regulation. Where feasible avoid products which contain items in the REACH Candidate List of substances of very high concern.

- Avoid the use of brominated flame retardants which are considered to be toxic, persistent and bioaccumulative.
- Avoid anti-fouling products in water sports and on buoys or markers containing arsenic or mercury or tin.²⁵
- Avoid sports goods containing substances toxic to wildlife that may persist in the environment after an event e.g. ski wax, artificial turf (with plastic fibres) and textiles containing toxic chemicals such as fluorinated compounds.
- Avoid using chemicals outdoors that are known to be toxic to wildlife wherever less-damaging alternatives exist. Seek eco-friendly alternatives and ensure that any chemicals used are biodegradable within a short time span.
- Avoid single-use plastics and oxo-degradable²⁶ plastic materials (which break into small pieces that persist in the natural environment) and preferably avoid, or at least minimise the use of disposable plastic goods and packaging.

Actions to take:

The best way to create an effective sustainable sourcing programme that accounts for all potential impacts on biodiversity and the wider environment is to apply the following guidelines:

Box 10: FSC-certified products at sports events

Sports events can be significant consumers of tree-based products (e.g. timber, paper, rubber) which without careful attention can impact on biodiversity. The best solution is first to limit the need, say through reducing quantities, using recycled products and avoiding printed matter. To meet the remaining need for timber and timber-based products, organisers should choose products from sustainably managed forests, being guided by certification schemes such as the Forest Stewardship Council (FSC).

FSC-certified products have been sourced for a variety of events, such as wooden baseball bats and volleyballs using FSC-certified wood and latex respectively. The result in these cases is to reduce biodiversity impacts through the event supply chain. Visibility of the FSC stamp can help raise awareness among spectators about eco-friendly procurement. For the UEFA (Union of European Football Associations) Euro 2016 tournament, all official tickets were printed on FSC-certified paper, with the logo clearly displayed.

23 <https://ic.fsc.org/file-download.fsc-market-info-pack-2016-2017.a-1728.pdf>

24 <https://ic.fsc.org/en/news-updates/id/1507>

25 Organotins are substances composed of tin bound to different organic compounds, often used as a biocide in anti-fouling paints, which are toxic to wildlife.

26 'Biodegradable' plastics are different from 'oxo-degradable' plastics; the latter contain artificial additives that cause plastic not to biodegrade but to break into small pieces which remain in the environment, causing harm.

1. Develop a sustainable sourcing code as soon as possible in the event planning phase.
2. Set a minimum standard for legal compliance but aim higher and select certified, eco-friendly goods and services; contract companies demonstrating sustainability awareness and practice.
3. Inform the market well in advance of procurement timing and requirements so potential suppliers can be prepared.
4. Include all sustainability requirements within calls for tenders, highlight their importance and tell prospective suppliers how such matters will be evaluated.
5. Make sure biodiversity criteria are stated in priority spend categories, including requirements for eco-friendly behaviour to promote best practice in supply chains.
6. Ensure sustainability requirements are written into contracts and that contractors and suppliers fully understand their legal obligations.
7. Monitor contract implementation and management.
8. Procure goods and services that minimise waste generation and ensure there are clear requirements for handling or taking back packaging, and post-event disposal of items (return, reuse, repurposing, recycling, donation etc.).

This approach should also be taken when signing up new sponsors and licensees. Where there are already contractual arrangements in place, the emphasis should be on encouraging good practice through collaboration.

Operational planning

Part 2 of these guidelines focusses on delivering the event, both set up and operational management. During the planning phase, it is important to make sure that biodiversity considerations flow through into operational planning. Tangible impacts occur in the event delivery phase, but many can be anticipated and avoided through careful planning.

Critical issues potentially affecting the venue and its surrounds are water resource management, pollution control, waste management, transport and energy. Other functions such as catering can have implications for biodiversity but also offer opportunities to support local, environmentally responsible producers. This is also the time to plan in more detail how to promote and communicate about sustainability at the event.

Actions to take:

1. Define roles and responsibilities to ensure there are competent people in charge of biodiversity and other environmental issues for each of the operational functions.
2. Identify specific issues that need to be addressed and provide appropriate training and support (e.g. equipment and materials, back-up expertise).

Education and training

Having defined roles and responsibilities during the strategic planning phase and establishing the sustainability management system, it is then critical to ensure people have the necessary resources, tools and skills to perform their tasks. Beyond merely ensuring task-specific training, sports events have a great opportunity to foster skills development and build capacity in the local workforce and through the supply chain.

It is important that all those whose tasks potentially affect the natural environment are fully briefed on the ecological features of the site and what they need to do to avoid impacting these areas. Much of the training will be carried out on site during the event delivery phase but needs to be planned well in advance.

Course content would typically cover:

- The venue's features of ecological interest (habitats, individual trees), position of drains and any areas vulnerable to erosion.
- Understanding the environmental risks involved in operating the venue and staging an event – generally and function-specific.
- Specific measures to be undertaken to protect ecological features.
- Pollution prevention.
- Incident management (observing, reporting, acting).

Biodiversity-specific aspects may require external experts either to create the content or deliver it. They may need an overview of what is involved in event operations so they can tailor their training accordingly.

Staging a sports event can help develop environmental skills among a venue's existing ground staff, build capacity among local NGOs and raise

awareness of biodiversity conservation in the event's wider audience. Such opportunities may well be identified through the stakeholder engagement exercises carried out as part of strategic planning.

Another critical element of training that is particularly relevant during the planning phase relates to procurement. Sustainable sourcing is a relatively new discipline and many of the specific links to biodiversity may not be well known. Training should cover legal constraints, what to specify in tender briefs, and how to evaluate responses and carry out due diligence on prospective suppliers, licensees and sponsors.

Larger event organisations may have in-house sustainability teams capable of developing the necessary training programmes but could lack biodiversity expertise and require support from outside experts.

Actions to take:

1. Integrate sustainability into workforce event training modules, especially to target:
 - a. Operational staff and volunteers working in key functions (e.g. overlay construction, spectator services, logistics, cleaning and waste, transport, energy).
 - b. Contractors (notably overlay installers, security, catering and cleaning).
2. Ensure biodiversity aspects are covered in relation to:
 - a. Site-specific protection measures.
 - b. Pollution prevention.
 - c. Monitoring and incident management.
3. Provide specialist training to support sustainable sourcing.
4. Capture lessons learned to feed into future iterations of training material.

Communications

Communicating publicly about sustainability always requires careful planning. It is important to define the narrative you wish to promote, the channels to use to disseminate your message, and the best timing to maximise uptake. This can be challenging because the event's main focus is sport and badly crafted or mistimed messages will not have the planned effect.

In some ways communicating about biodiversity conservation is easier than general sustainability messaging, because it is more visual and tangible.

People can appreciate a landscape and its wildlife and what is being done to protect it. The challenge is making the messaging both appealing and relevant to people whose primary interest is watching sport.

Done well, communication about biodiversity through sports events can be a powerful way of raising awareness among new audiences and establishing long-term benefits for the venue and local communities.

While planned communications will aim to promote positive biodiversity stories, in practice communications efforts sometimes have to address incidents or issues that may impact your biodiversity messaging. These could include: unnecessary tree removal or vegetation clearance; disturbance of sensitive species from nesting, breeding or roosting sites; dead or injured wildlife found at the venue; or protests about the origin of supplies such as timber, meat, fish and seafood. While some of these incidents may seem unlikely, they are all drawn from real examples encountered at various sports events. It is best to be prepared and have effective responses and protocols at the ready.

Actions to take:

1. Communicate about the measures being taken at the event to mitigate impacts on biodiversity, to set an example of good practice and raise awareness of biodiversity and conservation.
2. Invite local conservation organisations to provide information on the biodiversity of the host area, and highlight any special, highly threatened or protected plants and animals. Together with any other information on biodiversity gathered during the earlier planning stage for the event, this can feed conservation messaging.
3. Link communications about biodiversity to the work of local conservation organisations where relevant.
4. Provide information materials for athletes, spectators and the wider public on biodiversity, to communicate sustainability requirements and expectations about behaviour.
5. Provide visitor information using signage, posters, apps and blogs to explain about the wildlife found at the venue, highlighting any species of particular interest.
6. Provide signs to explain why some areas are protected (e.g. may be a habitat for threatened species or support a diversity of native plants and animals).

7. Provide information on biodiversity found in the wider host area to support 'green tourism' initiatives.
8. Provide some 'dos and don'ts' for athletes (Box 23), spectators and service providers regarding the natural environment and biodiversity at the venue, giving clear reasons for any restrictions on behaviour.
9. Where a mascot is being used based on an animal, issue a simple conservation message that advocates action to ensure the species' survival.

Partnerships with conservation organisations

Formal partnerships with conservation bodies can be a good way to foster positive relations with influential stakeholders, gain expert knowledge and

advice, and collaborate on joint projects linked to the sports event, leading to a positive contribution to biodiversity conservation. These tend to make most sense when involving permanent sports organisations, rather than temporary organising committees of sports events, as such agreements need to have long-term initiatives to achieve meaningful conservation goals.

Sports events offer high-profile opportunities to showcase joint work on conservation projects (Box 11). However, event organisers and their potential NGO partners should be very clear on what the partnership aims to achieve.

There may be opportunities to facilitate partnerships between event sponsors and conservation NGOs. These can generate good public relations

Box 11: Partnerships in sports events to benefit biodiversity

1. Sanlam, a financial services player with a footprint in 14 African countries, sponsors Team Sanlam Painted Wolf, an elite South African expedition racing team that competed in the 2016 Adventure Racing World Championships. To help protect the South African wild dog, the team completed a 627 km course involving 14 stages of expedition-length adventure racing (kayaking, pack rafting, trekking, caving and mountain biking) to raise awareness and funds for the cause.²⁷
2. The World Rowing Federation, FISA, and WWF have announced a strategic alliance²⁸ to promote clean water. They plan to educate rowers about the importance of clean water and to make environmental impact a more significant criterion in event bidding, to ensure that rowing events do not have a negative impact on water courses. According to the Head of the Global Water Stewardship Programme at WWF, the rivers and lakes where competitions are held are an integral part of much larger, often threatened ecosystems. The alliance enables new audiences with a direct link to water to be reached, helping to deliver on conservation goals.
3. Absa, sponsor of the Cape Epic cycle tour in South Africa, supports the Cape Leopard Trust²⁹ as one of its charities. The Cape leopard is used as a flagship species to highlight environmental issues. The cyclists pass through leopard territory, so the Cape leopard is seen as a 'fantastic brand ambassador' for the event, identifying with the determination required to complete the 'untamed' mountain bike race. The collaboration will leave a positive legacy not just for cycling but for the people and leopards in and around the communities affected by the event.
4. The Ocean Race has a UN Clean Seas 'Turn the Tide on Plastic'-branded boat³⁰, backed by the main sustainability partners the Mirpuri Foundation and Ocean Family Foundation, and supported by media partner Sky Ocean Rescue. The race is dedicated to ocean health and raising awareness of ocean issues; it has an on-board ocean quality sampling programme.
5. For the Minnesota Super Bowl in 2018, the National Football League (NFL) planned a 'green legacy', including a range of urban forestry activities: more than 12,000 trees and native plants were planted in local parks and recreation areas, creating pollinator gardens.³¹ The NFL partnered with the Arbor Day Foundation.

27 <https://www.sanlam.co.za/sponsorships/sport/Pages/default.aspx>

28 <http://www.worldrowing.com/environment/fisa-wwf-strategic-alliance/>

29 www.capeleopard.org.za

30 <https://www.volvoceanrace.com/en/teams/Turn-The-Tide-On-Plastic.html>

31 <http://www.woodworkersjournal.com/nfl-super-bowl-committee-community-partners-plant-trees/>

and potentially increase resources for conservation, but the main purpose of sponsorship is for the sports event. Any additional activities with a third party should be compatible with the event delivery and not create brand confusion or competition for resources.

Another growing form of collaboration is between sports event organisers and organisations offering forms of carbon offsetting (Box 12). These are beneficial provided they supplement a strong sustainability programme that as a priority tackles the event's direct impacts. This is important to avoid potential criticism that offsetting is being used as a way of continuing business as usual without making any meaningful attempt to address impacts arising from an event.

Actions to take:

1. Build on stakeholder engagement to identify local conservation groups to collaborate with.
2. Identify tangible projects for collaboration.
3. Invite and offer incentives for volunteers from conservation groups to act as stewards at the event and help ensure that potential impacts on biodiversity are avoided or minimised, and to support publicity for these groups.
4. Consider formalising relationships with a memorandum of understanding, so that all parties are clear on roles, responsibilities and intended outcomes.

Measuring, monitoring and evaluating performance

To be able to demonstrate progress on meeting biodiversity objectives, it is important to collect and analyse relevant biodiversity data. This is vital to evaluating performance and responding if actions are falling short of the targets. Such an approach is integral to any effective management system and is a key part of ISO 20121.

Monitoring the effectiveness of biodiversity-related actions is based on comparing a baseline situation (before the event) to the situation during and after the event with the aim of leaving biodiversity in the same state as before, or even better. This may include indicators such as extent of habitat being managed for conservation, changes in populations of key species of plants and animals, species diversity, or simply number of species occurring.

In biodiversity monitoring, it is important to note that habitats and species populations might undergo change from other causes – natural or otherwise – not specifically due to the sports event. In practice, and given the timeframe for most sports events, biodiversity monitoring is often best considered by tracking against intended outcomes or performance targets. These measures would be fairly easy to check and report against. While they would not inform directly about ecological change, they would be good indicators of responsible

Box 12: Partnerships to offset carbon emissions and restore green spaces

The annual Tour of Britain, a cycling road race, attracts some of world cycling's biggest stars. In 2018, a new initiative was launched in which the Tour will partner with the charity I Dig Trees to plant saplings on behalf of the winners of every stage of the race.³² Trees planted will be heritage varieties matched with host regions; e.g. Avalon Plum in Bristol, Bardsey Apple in Newport, Core Blimey Apple in London.³³ They are intended to offset carbon emissions associated with the event and to improve green spaces for public recreation and access to biodiversity.

A partnership between The Philadelphia Eagles and The Conservation Fund³⁴ plants trees and restores habitat for wildlife, specifically eagles. The team donates each year to this fund, to offset carbon emissions associated with team travel. Since 2007, an area equivalent to almost 19 football fields planted with oak, hickory and elm trees in several locations has contributed to 'a big win' for wildlife, including the bald eagle.

32 <https://www.ovoenergy.com/tour-of-britain>

33 <https://www.sportindustry.biz/news/ovo-energy-digs-trees-tour-britain>

34 <https://www.conservationfund.org/carbon-and-climate/legacy-of-go-zero/treehouse-blog/796-on-the-wings-of-eagles-soaring-high-at-seven>

Box 13: Monitoring and reporting on an international mountain biking event

The Absa Cape Epic is the largest full-service off-road mountain bike stage race in the world.³⁵ Each year, competitors cycle through unspoilt mountainous landscapes of South Africa's Western Cape. An environmental management plan (EMP) is prepared for this event, including clear objectives and required performance outcomes. These include parameters such as disturbance levels, damage to vegetation and control of waste, all of which relate to biodiversity conservation. The event is audited against this EMP to ensure that damage to the environment is minimised. An environmental control officer (ECO) checks sensitive areas on the 800 km route and collates information from two route sweepers (who patrol the entire race route on foot, bicycle or vehicle, to ensure that no race litter is left behind) and a fire control officer (who ensures that the event is safe from a fire risk point of view and performs daily checks at water points, race villages and spectator points). The ECO delivers a comprehensive report to the organisers after the event highlighting issues and recommendations for improvement.

management and could complement longer-term biodiversity monitoring.

Follow-up surveys to assess post-event conditions can be difficult due to the tight time constraints for taking down overlay and clearing the venue. In situations where potential ecological impacts are considered likely or serious it is important to anticipate monitoring after the event as part of any venue use agreement.

In complex situations and for large-scale events where ecological monitoring is required, the

parameters should be based on indicators related to the biodiversity objectives set for the event and relevant to the sport and venue. By monitoring the chosen indicators before and after the event, related to expected impacts on biodiversity, organisers can check if the goals were achieved and identify areas for improvement.³⁷ Such monitoring is particularly useful for repeat events at the same venue, whereby biodiversity trends can be seen over time.

Biodiversity surveys and monitoring are specialised activities and should be carried out by

Box 14: Audit to assess the impacts of golf events³⁶

The 2018 Ryder Cup matches took place at Le Golf National course near Paris which was created in the mid-1990s from intensive agricultural land. All the wildlife habitat on the site has been created as part of the course development and subsequent management.

Building on earlier environmental initiatives for the Ryder Cup dating back to the 1997 matches held at Valderrama in southern Spain, the organisation of the 2018 edition had a strong focus on sustainability. This included encouraging spectators to minimise travel and segregate waste, and committing to leave a lasting community legacy. Approximately 250,000 fans attended Le Golf National competition.

Aiming to reduce any negative impacts on wildlife, the course managers and the French Golf Federation asked the Natural History Museum in Paris to audit the wildlife in the vicinity of the golf course. This established a database of existing wildlife information and a plan was developed to guide site management to minimise potential ecological impacts. The project is seen as a chance to enhance the sport's reputation and show its support for biodiversity conservation.

Elsewhere in France, golf clubs in Chantilly and Villedaube have followed Le Golf National by starting their own biodiversity audits, and others are being encouraged to do the same as part of a larger project called the Biodiversity Programme in French Golf.

35 <http://www.ncc-group.co.za/blog/2013/05/environmental-management-absa-cape-epic-2013>

36 <https://sportsustainabilityjournal.com/news-analysis/french-golf-audits-its-biodiversity-impact-following-ryder-cup-project/>

37 <http://www.humankinetics.com/excerpts/excerpts/postevent-communication-an-integral-component-to-overall-event-success>. See also section three of: <https://portals.iucn.org/library/sites/library/files/documents/2018-049-En.pdf>.

experts, either professional consultants, or staff or volunteers from conservation NGOs. Timing is critical due to seasonal influences and should be incorporated into the event planning.

A key part of performance evaluation is to promote continual improvement and learning that can be incorporated into the planning of future events at the same or other venues. Event debriefs should include sustainability and biodiversity outcomes. If it is the first time an event has addressed sustainability, then the performance measured provides a baseline from which to set future goals.

Actions to take:

1. Ensure that reliable baseline data on biodiversity are gathered against which to measure the impacts of the event.
2. Specify measurable targets, in simple terms, that reflect the biodiversity goals set for the event e.g. 'no erosion of riverbanks', 'no destruction of bird nests', or 'improvement in a particular habitat'.
3. Select indicators to measure performance against these biodiversity targets (e.g. the condition of a particular habitat to be restored),³⁸ Monitor the indicators before and after the event, against which to audit performance and make continual improvements (Box 13 and 14).
4. Invite feedback from key stakeholders involved in the event about whether their expectations for managing nature have been met. Stakeholders could include environmental agencies and conservation NGOs, as well as the event workforce.
5. Publish and disseminate monitoring results.

Sustainability reporting

Last but not least comes the need to report publicly about the event's performance and lessons learned.

Formal sustainability reporting is becoming more common for larger sports events. While this may have a limited audience, it is important in gaining credibility with stakeholders who can support broader messaging. Sustainability reports are also valuable in sharing knowledge for future events.

In recent years, sustainability reporting for mega sports events has evolved considerably and some events use the Global Reporting Initiative standards for sustainability reporting.³⁹

Biodiversity data should be incorporated into the overall event sustainability report. The main challenge here is that any biodiversity monitoring data may not be available in time for reporting deadlines. That is why most reports tend to be more narrative in style, focussing on specific practical measures undertaken to safeguard habitats and species, avoid pollution, planting/habitat-creating projects and awareness-raising initiatives. Even where there is no plan for a formal sustainability report, any biodiversity-related assessment such as field surveys and species inventories will be valuable for local conservation groups and should be shared.

Actions to take:

- Decide on the scope and focus of the report and allocate responsibilities for research and drafting.
- Confirm report timescale, publication time and intended audience.
- Define the report outline, to include:
 - Organisation's policies and strategy and their link to biodiversity aspects
 - Strategic goals related to biodiversity
 - Description of actions undertaken and results obtained
 - Analysis of progress
 - Recommendations and future targets
 - Tables of data and reference material
- Consider a peer review or other form of validation process.

38 See Addison, Carbone and McCormick, *The development and use of biodiversity indicators in business*.

39 <https://www2.globalreporting.org/standards/g4/Pages/default.aspx>



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PART 2

Part 2. Delivering the sports event: addressing biodiversity opportunities and impacts during the event

With the foundations of biodiversity management planning having been explained in Part 1, the following sections suggest specific biodiversity impact mitigation measures that can be implemented or considered in the three main stages of delivering a sport event: setting up, staging and taking down.

There are also opportunities to enhance biodiversity during a sports event and leave a positive legacy. The type of measure will depend on the context (biodiversity values of the site, stakeholder preferences, funding available and so on), but any positive action will count. Actions to deliver benefits to biodiversity will need to be decided during the planning stage, with primary responsibility for implementation resting with the event organiser.

This part of the guidelines first describes the possible enhancement measures that can be adopted to support biodiversity conservation followed by the main biodiversity considerations and potential negative impacts relevant to the service providers typically involved in sports events. All of these providers have a role to play in ensuring that the biodiversity opportunities and risks associated with the event are effectively managed, from the event organiser to the venue manager, the fields and grounds manager to contractors responsible for cabling and wiring, lighting and sound systems, to the managers of sports teams and spectators. Figure 3 lists these service providers.

2.1 Supporting biodiversity conservation through the sports event

Opportunities to support biodiversity conservation may be split into practical conservation measures and educational or promotional activities that use the event to promote wider awareness and support.

Broadly speaking, and as noted in Part 1, a sports event can leave a positive legacy for biodiversity by supporting projects that continue after the event to restore or improve natural areas which are



Figure 3: Service providers typically involved in delivering sports events

degraded. These projects might aim to compensate for impacts on areas affected by temporary facilities, or simply improve surrounding areas as a gesture of goodwill towards the host region. They could include:

- Commissioning ecological surveys and management plans for all or part of the venue or neighbouring natural areas.
- Carrying out ecological management in designated areas of the venue or offsite – clearing rubbish from waterways, establishing ecological corridors, re-connecting isolated patches of nature to create ‘green networks’, planting trees, creating new wetlands or flower-rich grasslands, and creating micro-habitats for smaller animals, such as log piles and dry stone walls.
- Designing wildlife-friendly landscape areas in more formally managed areas of the venue.

- Erecting bird nesting boxes and/or bat boxes at the venue.
- Installing green roofs, green walls and sustainable urban drainage systems as part of venue improvements.

There is significant potential for sports events to raise awareness about biodiversity, its values to people, links to sport, and the importance of conservation among teams and athletes, spectators and the public, both during the event and beyond. All forms of media and communication (including broadcast, written, electronic, radio and social media) can be used. Athletes have a unique opportunity to disseminate conservation messages through their fans, and through social media, could influence behaviour and values across a wider community (Box 15).⁴⁰

Box 15: Using sports events to raise awareness about conservation

1. The **#WhoseSideAreYouOn** campaign⁴¹, launched in 2014, strives to stop illegal trade in wildlife. Sporting icons including Lewis Hamilton (Formula 1), Andy Murray (tennis), Chris Froome (cycling) and David Beckham (football) amongst others, are ambassadors for this movement.
2. An initiative of the **Campaign for Wildlife Conservation**, started by the Lao Illegal Wildlife Trade Action Group (with representatives from government, NGOs and international bodies) was launched in 2009 to coincide with the 25th South East Asian Games in Vientiane. The Games saw a collaboration between Lao Peoples Democratic Republic government agencies, NGOs, international organisations, companies and youth volunteers to spread the message of wildlife conservation to the thousands of visitors to that event. Media coverage included television adverts, radio spots, billboards, and banners at airports while motorbikes, cars and public transport displayed stickers with the campaign slogan.
3. The **Tour de Tuli**⁴² is a four-day, premier mountain bike event held in South Africa, Botswana and Zimbabwe, including one game reserve and a national park. The event raises funds for a non-profit organisation: Children in the Wilderness. The Tour has raised funds to host over 7,000 children on their ‘eco-camp’ programme since 2001, 3,300 children are reached through an ‘eco-club’ programme, and 900 teachers and ‘eco mentors’ have been trained across seven southern African countries. The organisation aims to facilitate sustainable conservation through leadership development and environmental education in Africa.

By introducing visitors to wildlife in the host region, sports events can help promote nature-based tourism, sometimes boosting revenue for protected areas. High-profile events and personalities can draw attention to wildlife and conservation issues

with athletes or teams serving as ambassadors for nature. During the NFL Super Bowl commercials, for example, linking famous athletes to a biodiversity challenge could reach a wide pool of potential donors for conservation.⁴³ To celebrate and raise

40 Blankenbuehler and Kunz 2014.

41 <https://www.wwf.org.uk/updates/duke-cambridge-and-david-beckham-launch-whosesideareyouon-campaign>, <http://www.unitedforwildlife.org/>.

42 <https://www.outsideonline.com/2038141/southern-africas-tour-de-tuli-5-nights-4-days-3-countries-1-mountain-bike>; <https://www.childreninthewilderness.com/tour-de-tuli/>; <https://www.childreninthewilderness.com/>.

43 IGEL *et al* 2013

awareness of local biodiversity among spectators at the 2018 Ryder Cup⁴⁴, the organisers created a photography competition which included the theme ‘wildlife around Le Golf National’.

Educational and promotional opportunities may include:

- Raising awareness and influencing behaviour by informing sports teams, spectators, contractors and all parties involved about biodiversity at the venue and in the local area, and ways in which it is being conserved.
- Initiating educational projects in partnership with local conservation organisations and event sponsors.
- Direct messaging to fans and spectators about the wildlife occurring at a venue – via media channels and on-site interpretation boards.
- Integrating biodiversity content into training modules for staff, contractors and volunteers;
- Signing up to relevant campaigns such as Sports for Climate Action⁴⁵ and the Clean Seas initiative.⁴⁶

- Incorporating biodiversity themes into event ceremonies, merchandise and mascots.
- Implementing environmentally responsible policies for products used at the event such as plastics, food, and fabrics.
- Securing endorsements of conservation initiatives by sports stars.

Fundraising at events, both charitable and commercial, can help support initiatives of local conservation organisations (Box 16). The number of potential donors for biodiversity conservation is extremely large given the extensive fan base following sports events, including many people not normally reached by conservation campaigns. Sponsors can contribute to biodiversity conservation, through advertising, donations, merchandise, competitions and prizes. Other opportunities to harness support for biodiversity include forming partnerships with conservation organisations working in the host area to increase their capacity. Engaging volunteers during outdoor events can foster an interest in wildlife and the natural environment.

Box 16: Sports events to raise funds for biodiversity conservation

1. In South Africa, the Pilanesberg Wildlife Trust holds an annual golf tournament. All funds raised from this event go towards rhino protection in a local game reserve, funding a rhino poaching unit and associated equipment.⁴⁷ The Wild Series Challenges, a number of sports events, similarly raise funds for African wild dog, vulture and crane conservation.⁴⁸
2. The US National Hockey League Green has a Hat Tricks for Trees™ programme⁴⁹ through which it pledges to donate 50 trees to the Nature Conservancy’s Plant a Billion Trees campaign when a hat trick is scored. The League has managed to unite the exciting game of hockey and saving trees in a creative way, aiming to restore both urban and tropical forests through this programme. Similarly, NASCAR has initiated several long-term programmes including investment in reforestation and biodiversity projects, traditional and digital tree planting programmes⁵⁰, and wetland conservation.
3. Athletes taking part in sports events can contribute to conservation through individual sponsorships such as Run Wild with WWF⁵¹, thereby helping to finance global issues like curbing illegal wildlife trade and deforestation. Athletes can also support conservation through their entry fees or by supporting event charities.

44 <https://www.rydercup.com/sustainability>

45 <https://unfccc.int/climate-action/sectoral-engagement/sports-for-climate-action>

46 <https://www.cleanseas.org/about>

47 <https://www.pilanesbergnationalpark.org/media/wild-about-golfing/>

48 <http://www.wildseries.co.za/>

49 <https://www.nhl.com/news/nhl-green-launches-hat-tricks-for-trees-tm/c-13008>

50 <https://green.nascar.com/join-nascars-clean-air-tree-planting-program/>

51 https://support.worldwildlife.org/site/SPageServer/?pagename=panda_nation_athletic_event_fundraising

2.2 Measures to mitigate the impacts of sports events

The following 12 sections provide guidance for the service providers typically involved in a sports event, as described in Table 2.2. These sections (2.2.1 to 2.2.12) correspond with the main areas where a sports event can affect biodiversity. They outline a wide range of actions and solutions that can be used to mitigate the potential negative impacts of sports events on biodiversity. Each section includes actions that can be taken to mitigate impacts during the setting up, staging and taking-down phases of the event.

As some biodiversity impacts, such as those of transport and waste management, are common to nearly all services, certain actions are repeated across the sections. Applicability of these actions will vary depending on the scale and nature of the event and type of venue.

The proposed actions are based on the assumption that avoiding and minimising impacts on important areas for biodiversity (Box 1) are more effective than carrying out remedial restoration work. Furthermore, because different venues in different countries or regions have different biodiversity characteristics, and given the wide variety of sports events, mitigation measures need to be tailored to particular conditions. For this reason, one-size-fits-all measures to mitigate impacts during the delivery of a sports event are not recommended in these guidelines. Consultation with local ecological or environmental specialists on the various issues outlined is advised to ensure the most appropriate action is taken.

Table 2.2: Mitigation actions relevant to different service providers at a sports event

Service provider	Main activities having potential impact	Section
Event organiser	Fields and grounds management	2.2.1
	Overlay	2.2.2
	Outdoor cabling and wiring	2.2.3
	Outdoor security	2.2.4
	Outdoor lighting	2.2.5
	Public service announcements, outdoor sound systems and noise	2.2.6
	Broadcasting outdoors	2.2.7
	Solid and liquid waste management	2.2.8
	Catering	2.2.9
	Transport and on-site traffic management	2.2.10
	Outdoor spectator management	2.2.11
	Management of sports teams	2.2.12

Venue manager	Fields and grounds management	2.2.1
	Overlay	2.2.2
	Outdoor cabling and wiring	2.2.3
	Outdoor security	2.2.4
	Outdoor lighting	2.2.5
	Public service announcements, outdoor sound systems and noise	2.2.6
	Broadcasting outdoors	2.2.7
	Solid and liquid waste management	2.2.8
	Catering	2.2.9
	Transport and on-site traffic management	2.2.10
	Outdoor spectator management	2.2.11
	Management of sports teams	2.2.12
Field and grounds manager (if separate from venue manager)	Fields and grounds management	2.2.1
	Overlay	2.2.2
	Outdoor cabling and wiring	2.2.3
	Outdoor security	2.2.4
	Outdoor lighting	2.2.5
	Public service announcements, outdoor sound systems and noise	2.2.6
	Broadcasting outdoors	2.2.7
	Solid and liquid waste management	2.2.8
	Transport and on-site traffic management	2.2.10
	Overlay construction team	Overlay
Outdoor cabling and wiring		2.2.3
Outdoor security		2.2.4
Outdoor lighting		2.2.5
Public service announcements, outdoor sound systems and noise		2.2.6
Cabling and wiring contractor	Outdoor cabling and wiring	2.2.3
Outdoor security service contractor	Outdoor security	2.2.4
Lighting contractor	Outdoor lighting	2.2.5
Sound system contractor	Public service announcements, outdoor sound systems and noise	2.2.6
Broadcaster	Broadcasting outdoors	2.2.7
	Outdoor cabling and wiring	2.2.3
Waste management contractor	Solid and liquid waste management	2.2.8
Catering contractor	Catering	2.2.9
Transport management contractor	Transport and on-site traffic management	2.2.10
Spectator manager	Outdoor spectator management	2.2.11
Sports teams manager	Management of sports teams	2.2.12

2.2.1. Fields and grounds management

Who should read this section?

- The event organiser
- The venue manager
- Field and grounds manager

Scope

Fields and grounds management covers the sports grounds as well as facilities for organisers, competitors and spectators at an established venue. At outdoor venues, it includes managing the natural environment – maintaining soils, vegetation, wildlife and water. Venue managers are responsible for maintaining the biodiversity within the venue's perimeters.

When a sports event is held on grounds managed by a city or local municipality, responsibility lies with them. For sports events that are not held at an established venue, the local organising committee is responsible for safeguarding affected biodiversity, taking specialist advice and appointing an environmental manager for the event where appropriate.

Biodiversity objectives

- Avoid impacts on important areas for biodiversity.
- Avoid impacts on the habitats of threatened or protected species.
- Avoid harm to ecosystems and species, directly or indirectly, from water use at a sports event.
- Avoid harm to native species through the introduction of alien and invasive organisms or pathogens.
- Minimise damage to natural ecosystems and habitats.

- Restore or repair any damaged areas as soon as possible after an event.

Biodiversity considerations and impacts

It is important to identify risks to biodiversity early on so that potential impacts can be mitigated through the appropriate siting of temporary infrastructure and playing fields, and carefully planning how the event will be managed. Further guidance is offered in Part 1: *Laying the foundations*.

Chemicals such as pesticides and fertilisers used to prepare playing surfaces immediately before or during an event may be toxic to wildlife and could disrupt ecosystem function. Runoff from these areas can pollute terrestrial and aquatic habitats and may kill wildlife.

Litter and other waste can also harm wildlife and should be managed responsibly, preferably through reuse, recycling, and disposal in dedicated bins. For example, discarded bullets from shooting competitions can result in lead poisoning of animals, and lost golf balls can pose risks to marine animals if not collected and disposed of correctly (Box 17). Fireworks pollute aquatic ecosystems as they contain traces of heavy metals. The residual waste from firework displays (both chemical⁵² and solid waste) is detectable in soils and watercourses, and animals may be poisoned if they eat discarded firework tubes. Helium balloons and sky lanterns (Box 18) travel large distances and cause damage or death to wild animals far from the event's location if not collected. There may also be accidental disposal of toxic or hazardous materials such as chemicals or medical waste which could cause injury or death to wildlife if not cleaned up immediately and disposed of safely.

Box 17: Risks to wild animals of not cleaning up after sports events

The core of golf balls contains zinc acrylate which is toxic to many organisms. For example, in marine environments, if left on the sea floor, golf balls deteriorate and spill their rubber band-like cores. Fish, seabirds and marine mammals can mistake the rubber band strands for seagrass and eat them. Feeling like they are full, the animals stop eating and starve to death.

52 https://www.epa.gov/sites/production/files/2014-03/documents/ffrofactsheet_contaminant_perchlorate_january2014_final.pdf

Box 18: Helium balloons and sky lanterns at sports events⁵³

Helium balloons and sky lanterns can be released in huge numbers at opening or closing ceremonies or sold at sports events. Around 90-95% of balloons rise to 3,000 km and burst into small fragments. Balloons may travel thousands of miles, polluting the most remote and pristine places. As an indication, beach litter surveys in the US, Canada and the UK have shown the number of balloon pieces found on beaches has tripled in the past decade.

Dolphins, whales, turtles and many other marine and freshwater species, as well as terrestrial animals and birds, can eat the burst balloons which may block the animal's digestive or respiratory tract, causing starvation or suffocation. Some animals can also suffer injury or die if they become entangled in balloons or their ribbons. Sky lanterns may travel some distance while alight, and pose a fire hazard and risk to wildlife on landing; they have been banned in over 20 states in the US and in a number of other countries.⁵⁴ The use of balloons and sky lanterns has been banned on council property by a number of district councils in the UK due to littering and danger to wildlife.⁵⁵

Water use is a major consideration at many sports events. It needs to be managed responsibly and wastewater disposed of in a way that prevents pollution of streams, ponds and other natural ecosystems. Sewage effluent should also be contained, treated and safely disposed of to avoid pollution.

Extracting water to supply an event can temporarily deprive freshwater ecosystems. Freshwater extraction is already a challenge for many regions⁵⁶ and the extra demand may exacerbate the situation. Events requiring large amounts of water to prepare for the sporting activity itself (e.g. snowmaking for skiing competitions or artificial water sport courses) require particular consideration. Over-extraction of water could disrupt hydrological regimes in natural habitats to the detriment of wildlife. In winter sports events, artificial meltwater and chemical runoff or dyes can pollute terrestrial and aquatic ecosystems, with negative impacts on biodiversity.

Other aspects to consider include heavy vehicle use which can compact soils, damage the surface roots of trees⁵⁷ and harm local ecosystems. Soils may also be eroded by the movement of

athletes and spectators, particularly along shorelines, riverbanks, and steep slopes, harming soil biodiversity and leading to sedimentation of aquatic ecosystems.

Another significant consideration is the potential introduction and spread of alien invasive species. Visitors to a sports event and the use of sporting equipment from outside the venue by athletes sometimes cause the unintentional introduction and spread of alien invasive organisms or pathogens which may threaten native plants and animals. Sailing events which take place across great distances can unwittingly move species from one region or country to another (Box 19).

Vegetation and soils damaged during the event should be restored afterwards, making sure the area is returned to the same state as before (Box 20). Restoration approaches are likely to vary according to different circumstances, depending on the type of ecosystem and physical conditions. For habitats that recover quickly, it may be enough to protect the damaged area from further impacts and allow it to recover naturally.

53 <https://balloonsblow.org/impacts-on-wildlife-and-environment>; <https://www.nytimes.com/1990/02/04/nyregion/l-the-effect-of-balloons-on-the-environment-423590.html>.

54 <https://www.dw.com/en/sky-lanterns-the-most-elegant-fire-hazard/a-51860495>.

55 <https://www2.swale.gov.uk/backing-for-a-ban-on-the-release-of-sky-lanterns-and-balloons/>

56 <https://www.eea.europa.eu/themes/water/water-resources/impacts-due-to-over-abstraction>

57 The 'feeder roots' of many trees lie close to the soil surface to supply the trees with water (rain, melting snow), nutrients and oxygen.

Box 19: Introduction of non-native species to marine environments as a result of sailing events⁵⁸

As the introduction of invasive species to British coastal waters is a major negative impact of sailing events, the UK's Royal Yachting Association (RYA) partners with various conservation charities (such as the Wildlife Trusts) in the Non-Native Species Secretariat (NNSS). The NNSS aims to stop the spread of invasive plants and animals in British waters through its 'Check-Clean-Dry' initiative⁵⁹ which provides advice to sailors on how to prevent the spread of invasive species. Sporting equipment is checked for mud, plants or animals which must be removed and left at the original site. Equipment is then cleaned and left to dry for a specified period to ensure that no unwanted organisms survive and spread. Similar initiatives are advocated in many other countries to stop the movement of pest species between waterways.

Box 20: Mitigating impacts after a major equestrian event, England

The annual Mitsubishi Motors (UK) Badminton Horse Trials has taken place at the Badminton Estate for 70 years. Held over four days, it is the largest paid-entry sports event in the United Kingdom⁶⁰ and the second largest in the world with more than 160,000 visitors to the 2017 event.⁶¹

Before the event, soils are compacted and eroded by heavy vehicles transporting equipment, damaging soil biodiversity and limiting vegetation regrowth. During the event, soils and vegetation on the estate can be damaged by vehicles, large tents, spectators and by horses' hooves. The extent of damage varies each year depending on weather conditions but is minimised by locating infrastructure in already modified areas. Damaged land is restored as soon as possible after the event, through physical methods (levelling rutted areas, aeration, seeding, etc.) rather than using chemicals, to prevent pollution.

Actions to take

The following table sets out actions for fields and grounds management to take to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

58 <https://www.rya.org.uk/knowledge-advice/environmental-advice/Pages/invasive-non-native-species.aspx>

59 <http://www.nonnativespecies.org/checkcleandry/>

60 <https://www.vanityfair.com/news/2009/05/prepping-for-the-scene-at-the-badminton-horse-trials>

61 <https://www.badminton-horse.co.uk/visitor-info/>

Table 2.2.1: Mitigating impacts through fields and grounds management

Guidance	Phase
Habitat loss or modification	
Ensure that heavy vehicles do not park under or near mature trees and that heavy equipment is not placed in these areas where surface roots can be damaged.	All phases
Mark all areas that are particularly important for biodiversity (Box 1) preferably as 'no go' areas in which impacts are avoided during the event, or as areas in which every effort must be made to minimise impacts. Ensure that overlay, areas to be cleared of natural vegetation for temporary infrastructure, and associated vehicular, athlete and spectator movement corridors are located away from these areas.	Setting up
Use already disturbed or transformed areas for overlay or dedicated use (e.g. snowmaking or parking) rather than clear natural vegetation.	Setting up
Avoid cutting down trees or removing branches by adjusting the siting of overlay, playing fields, spectator movement or transport routes.	Setting up
Allocate 'safe corridors' for sporting activities and spectator movement to allow for a vegetation buffer between important areas for biodiversity, areas vulnerable to damage (e.g. shorelines, riverbanks) and event activities (spectator corridors around a golf course, along a trail or marathon route, or near the coast at a sailing event).	Setting up
Ensure that all roads and tracks open for use during the event are clearly marked and parking areas are clearly signed to avoid vehicles going off road.	Setting up
Create obstacles such as water-filled ditches or use existing areas of dense vegetation as natural buffers or barriers to avoid harm to sensitive areas.	Setting up
For winter sporting events, use snow storage and piling that will not alter local water drainage and the associated freshwater ecosystems.	Setting up, staging event
Identify and restore any natural areas that have been damaged during the event as quickly as possible. For example, trampled vegetation or eroded riverbanks or coastal areas should be actively restored where natural recovery is not likely or will take too long (more than a few years).	Taking down
Use local native species to restore damaged areas and re-create lost wildlife habitat. In many cases, trampled or minimally disturbed vegetation cover will recover on its own and in some cases, disturbance can help maintain plant diversity.	Taking down
Disturbance or damage to wildlife	
Locate all overlay and select areas that will be cleared of natural vegetation for temporary infrastructure away from important areas for biodiversity to avoid negative impacts and minimise the need for restoration or repair work.	Setting up
Use control systems, including timers to avoid using lights unnecessarily.	All phases
Use essential lighting only, avoid lighting in known wildlife corridors (e.g. along watercourses), especially at night.	All phases
At night use lighting with a spectrum that does not disturb nocturnal wildlife. Avoid short wavelength 'blue' lights to minimise impacts on bats and insects.	All phases
Clear areas for dedicated use and carry out construction and set-up activities outside sensitive periods (e.g. breeding, moulting or nesting) where feasible.	Setting up
Minimise light pollution within, and spreading from, overlay areas.	Setting up

Use shade or down lighting in areas known to be habitats for light-sensitive wildlife.	Setting up
Restrict driving during particularly active times for wild animals (e.g. dawn and dusk) in natural and purposely modified landscapes, and limit vehicle use at night where feasible.	All phases
Limit vehicle speed to minimise risk of collisions with wild animals.	All phases
Prohibit the removal of wild plants and animals by staff, supported by appropriate penalties for offenders.	All phases
Minimise risks of collision with or electrocution of wild animals by installing cables and wires away from known animal movement or bird flight routes.	Setting up
Where there is a high risk of collision or electrocution, use highly visible markers attached to wires or cables (deflectors, diverters or flappers) to alert wild animals.	Setting up
Introduction of alien invasive species	
Avoid introducing alien and invasive plants or animals in soils, or as plant matter, seeds or insects attached to vehicles, equipment or clothing. Draw on available information and guidance on key alien invasive species in the host area to help identify these invasive organisms and prevent their introduction.	All phases
Disseminate guidelines to contractors, sports teams and athletes on preventing the introduction of alien invasive organisms.	Setting up, staging event
Prohibit the introduction of alien and potentially invasive species for ecosystem management (e.g. turf grasses), in relation to a sporting event (e.g. fish for a sport fishing competition) or for decoration.	Setting up, staging event
Eradicate pest plants and alien invasive animals, and quarantine and isolate animals affected by pathogens to prevent the spread of disease. Check for the spread of pests after the event, and where necessary, implement follow-up control or management measures.	Taking down
Soil erosion and compaction	
Avoid moving landscape soils for the event.	Setting up
Avoid using asphalt when building trails for an event and use gravel or geotextile paths to move people around the venue.	Setting up
Use permeable geotextiles or geofabric if the venue's playing or competition surfaces are waterlogged or prone to erosion.	Setting up
Monitor the effectiveness of erosion-prevention measures during the event and implement additional controls when needed.	Staging event
After the event, rehabilitate any eroded or compacted soils both structurally and in terms of soil biota. Compacted soils can be loosened and aerated to allow plant cover to re-establish. Physical methods, such as tillage, should be used rather than chemicals (e.g. fertiliser) to repair damage and restore vegetation.	Taking down

Depletion of water resources	
Reduce water use through recycling where possible and use water-efficient fittings and technology, especially in water-stressed or arid areas.	All phases
Use water-efficient competition surfaces, and 'water-wise' turf grasses adapted to local conditions to minimise water use, especially in arid, semi-arid or water-stressed venues.	Setting up
Pollution	
Clean up natural areas affected by any accidental spill of toxic or hazardous material immediately. Remove contaminated soils, dispose of them at licensed facilities, and revegetate affected areas as soon as it is safe to do so.	All phases
Prohibit the use of anti-fouling products in water sports and on buoys or markers (especially those containing arsenic, copper, zinc, mercury or tin ⁶²). These products are used to inhibit growth of algae and other organisms on watercraft, but many contain metals and chemicals (biocides) which are toxic to aquatic wildlife.	Setting up, staging event
For winter sports events, avoid using wastewater to make artificial snow.	Setting up, staging event
Avoid or limit the use of salt, dyes or paints to mark competition or spectator routes, as well as snow-hardening chemicals for skiing.	Setting up, staging event
Avoid using chemicals that are toxic to wildlife wherever less damaging alternatives exist. Seek eco-friendly options and ensure that any chemicals used are biodegradable within a short time span.	Setting up, staging event
Prohibit, where feasible, the storage of any toxic, hazardous and/or highly flammable chemicals, oils and fuels on site. Where unavoidable, and at a minimum, storage areas should have retaining walls or containment and be located away from important areas for biodiversity, including streams or other freshwater ecosystems. Only trained staff should have access to these areas.	Setting up, staging event
Provide easy access to emergency clean-up kits and establish roles and procedures for responding to accidental waste spills (i.e. for containing the spill, removing contaminated materials, and restoring or repairing polluted areas). Kits must be suitable to all potentially toxic or hazardous waste relevant to the event (chemicals, fuels etc).	Setting up, staging event
Store hazardous and/or flammable liquids (e.g. butane) securely within retaining walls, away from important areas for biodiversity, including streams or other freshwater ecosystems. Limit access to these areas to trained staff only. Safely store other toxic liquids such as paints, solvents and coolants away from water bodies. Drains to capture any spillages should not flow directly into watercourses.	Setting up, staging event
Prohibit the use of fireworks, balloons and sky lanterns at outdoor events in natural landscapes or close to important or protected areas for biodiversity and to prevent harm to wildlife.	Staging event
Remove all toxic or harmful chemicals used by different service providers during the sports event from the site as soon after the event as possible.	Taking down

62 'Organotins' are substances composed of tin bound to different organic compounds, often used as a biocide in anti-fouling paints, which are toxic to wildlife.

2.2.2. Overlay

Who should read this section?

- The overlay construction team
- The event organiser
- The venue manager
- Field and grounds manager

Scope

Overlay refers to all temporary elements added to permanent buildings and the portable infrastructure and services needed to deliver a sports event on land or in water. It also covers the equipment and infrastructure used by various service providers. These are outlined in the following sections which focus on the biodiversity considerations and impacts associated with each provider's area of responsibility.

Using overlay for sports events involves:

- a. creating parking areas, seating or spectator areas and facilities, competitor areas and facilities, shower and toilet blocks, commercial outlets and sponsor stands, generators, flooring, lighting, food stalls, tents, medical facilities, media and communications centres, marketing, promotions and advertising facilities, practice or warm-up areas for athletes, and any other temporary facilities or installations.
- b. bringing in, erecting or constructing these facilities and installations (setting up); and
- c. removing facilities and installations after the event, and restoring damaged or disturbed areas (taking down).

Biodiversity objectives

- Avoid locating overlay on or close to important areas for biodiversity.
- Minimise impacts on natural ecosystems and habitats by careful setting up and removal of overlay.

Biodiversity considerations and impacts

Overlay has a direct impact or 'footprint' on plant and animal life so it is preferable to avoid locating it in areas that are important for biodiversity and use land that has already been modified where possible. Impacts of overlay can extend beyond its immediate footprint by interfering with ecological processes such as animal movements to and from feeding or breeding grounds, and surface water flow, or generating waste or pollution.

Different types of overlay have a different intensity of use. Some generate noise (e.g. public address systems), others produce artificial light while others generate solid waste (e.g. food and beverage outlets) or pollution. Every venue is different in terms of the importance of its natural ecosystems and wildlife, and the sensitivity of native plants and animals to trampling, barriers, noise, lights and other potential impacts. It is important to identify risks to biodiversity early on so that impacts can be effectively mitigated as explained in Part 1.

Actions to take

The following table sets out actions for overlay service providers to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.2: Mitigating impacts of overlay on biodiversity

Guidance	Phase
Habitat loss or modification	
Use only the venue's established roads and tracks or routes and parking areas approved by the venue manager or organising committee for the event.	All phases
Ensure that heavy vehicles do not park under or close to mature trees and that heavy equipment is not placed in these areas where they can damage surface roots.	All phases
Always use previously disturbed or transformed areas for overlay or dedicated use areas rather than clear natural vegetation.	Setting up
For winter sports events, designate parking areas that help ensure clean water drainage and avoid moving sediments into local streams, which could modify these habitats.	Setting up
Designate specific areas to be used for cleaning vehicles away from local streams, to control water use and prevent sediment and pollutants entering and modifying freshwater ecosystems.	Setting up
Avoid cutting down trees or removing branches by changing the siting of overlay.	Setting up
Where contractors, athletes or spectators need to cross areas with soils, vegetation, streams or wet areas that are vulnerable to destabilisation or disturbance (e.g. dunes, riverbanks, wetlands), install elevated walkways to avoid damage.	Setting up
Use removable rather than concrete bases for temporary structures to minimise long-term damage.	Setting up
Ensure that all staff are aware of the 'dos and don'ts' regarding the natural environment and its biodiversity such as avoiding marked 'no go' areas, no removal of wild animals or plants, no discarding of waste in the natural environment, and no feeding of wild animals, explaining the contractor/subcontractor penalties for non-compliance.	Setting up
Ensure strict control measures to manage fire hazards in setting up and removing overlay.	Setting up, taking down
Remove all overlay as soon as possible after the event, taking care not to cause damage beyond the setting up disturbance area.	Taking down
Disturbance or damage to wildlife	
Locate all overlay and select areas that will be cleared of natural vegetation for temporary infrastructure away from important areas for biodiversity to avoid negative impacts and minimise the need for restoration or repair work.	Setting up
Use control systems, including timers to avoid using lights unnecessarily.	All phases

Use essential lighting only, avoid lighting in known wildlife corridors (e.g. along watercourses), especially at night.	All phases
At night use lighting with a spectrum that does not disturb nocturnal wildlife. Avoid short wavelength 'blue' lights to minimise impacts on bats and insects.	All phases
Clear areas for dedicated use and carry out construction and set-up activities outside sensitive periods (e.g. breeding, moulting or nesting) where feasible.	Setting up
Minimise light pollution within, and spreading from, overlay areas.	Setting up
Use shade or down lighting in areas known to be habitats for light-sensitive wildlife.	Setting up
Restrict driving during particularly active times for wild animals (e.g. dawn and dusk) in natural and purposely modified landscapes, and limit vehicle use at night where feasible.	All phases
Limit vehicle speed to minimise risk of collisions with wild animals.	All phases
Prohibit the removal of wild plants and animals by staff, supported by appropriate penalties for offenders.	All phases
Minimise risks of collision with or electrocution of wild animals by installing cables and wires away from known animal movement or bird flight routes.	Setting up
Where there is a high risk of collision or electrocution, use highly visible markers attached to wires or cables (deflectors, diverters or flappers) to alert wild animals.	Setting up
Introduction of alien invasive species	
Apply available guidelines and ensure strict controls on vehicles to prevent the introduction or release of alien invasive species.	All phases
Keep vehicles transporting overlay and associated equipment free of soil, plant material and seeds from outside the area, to prevent the introduction of alien invasive plants to the venue.	All phases
Soil erosion and compaction	
Use hardstanding for access wherever possible to minimise erosion and compaction.	Setting up
Design the layout of overlay to avoid the need to move or landscape soils.	Setting up
Use materials in overlay which can be readily removed and reused or recycled, contain no chemicals that are toxic or hazardous to wildlife, and generate minimum waste.	Setting up
Depletion of water resources	
Use dry toilet systems where temporary facilities are required in preference to systems that use local water supplies.	Setting up
Pollution	
Ensure that all sewage is disposed of in suitable treatment facilities.	All phases
Consider and implement ways to avoid, minimise and manage waste, favouring re-use and recycling of materials over disposable or non-reusable materials.	All phases

Dispose of any waste in bins provided for collection, re-use, recycling, composting or otherwise and ensure enough bins are provided for overlay waste.	All phases
Provide suitable containers for collecting and disposing of used fuels or oils, and other potentially toxic or hazardous wastes, to prevent pollution of surface water, groundwater and soils, and harm to wildlife.	All phases
Avoid storing any toxic or hazardous chemicals, oils and fuels on site.	All phases
Ensure waste and food products are stored properly to prevent access by wild animals. Use wildlife-proof bins.	All phases
Dispose of all toxic or hazardous materials at a licensed site.	All phases
In the event of an accidental spill of toxic or hazardous material, polluted areas must be cleaned up swiftly by removing contaminated soils and disposing of them at licensed disposal sites, and revegetating the affected area as soon as it is safe to do so.	All phases
Ensure that there are enough toilets for contractors, sports teams, spectators and other people attending the event.	Setting up
For water-based sports events, ensure adequate facilities to store sewage waste temporarily, for later disposal in an authorised treatment facility.	Setting up
Climate change and unsustainable sourcing	
Encourage the use of fossil-fuel free vehicles and renewable energy sources where possible. Any generators used should be energy efficient.	All phases

2.2.3. Outdoor cabling and wiring

Who should read this section?

- Cabling and wiring contractor
- The event organiser
- The overlay construction team
- The venue manager
- Field and grounds manager
- Broadcasters

Scope

Electric cables or wiring may be installed for public service announcements, broadcasting, media, lighting, communication or sound systems at sports events.

Biodiversity objectives

- Avoid harm to important areas for biodiversity in locating, setting up and removing cabling and wiring.
- Minimise impacts on wild animals and their movement by the careful siting of cabling and wiring.

Biodiversity considerations and impacts

Depending on their length, quantity and size, cables and wires can restrict or divert the movement of wild animals to and from important feeding and drinking areas. Some animals will avoid crossing unfamiliar structures while others may collide with them, particularly where they are difficult to see. Collisions of birds and other wild animals with electric cables or wires can result in injury, electrocution or death. Many birds have established flight paths between feeding and nesting areas, and mammals and reptiles have known movement routes between feeding and breeding or watering areas. Risks to wildlife from cables and wiring would be greater in previously open areas, but also across gaps in habitat (e.g. across rivers bordered by forest). Most bird injuries or deaths from wires or cables are due to their lack of visibility. Though less common, electrocution or electric burns can occur when an animal touches two live wires, or one live wire and an earth wire, essentially short-circuiting the current.

Actions to take

The following table sets out actions for service providers of outdoor cabling and wiring to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.3: Mitigating impacts of outdoor cabling and wiring on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid parking heavy vehicles or placing heavy equipment under or close to mature trees where they can damage surface roots.	All phases
Disturbance or damage to wildlife	
Locate cable and wiring routes to avoid important areas for biodiversity (Box 1).	Setting up
Minimise risks of collisions or electrocutions by installing cables and wires away from known wild animal movement or bird flight routes.	Setting up
Where there is a high risk of collision or electrocution, use visible markers on wires or cables (deflectors, diverters or flappers) to alert wild animals.	Setting up
Where wild animals such as monkeys or reptiles are known to move along electric wires, ensure that cables are well insulated to avoid electrocution.	Setting up
Remove all cabling and wiring and cable jacket, as soon as possible after the event, in a way that avoids or minimises disturbance to soils and vegetation.	Taking down

2.2.4. Outdoor security

Who should read this section?

- Outdoor security service contractor
- The event organiser
- The overlay construction team
- The venue manager
- Field and grounds manager

Scope

Temporary fencing or barriers can be erected to ensure the safety of athletes and spectators, guiding them and other 'traffic' along specific routes within the venue to protect important areas for biodiversity. Barriers can also be used in freshwater or marine ecosystems to guide athletes in the field of play.

Biodiversity objectives

- Avoid harm to important areas for biodiversity in locating, setting up and removing outdoor fencing and barriers on land and in water.
- Minimise impacts on wild animals and their movement by careful siting of fencing and barriers on land and in water.
- Avoid conflict between wild animals, athletes and spectators by careful monitoring and taking steps to prevent potentially dangerous contact.

Biodiversity considerations and impacts

Fences and barriers on land or in water can restrict or interfere with the movement of wild animals to and from their feeding and drinking areas as well their breeding or migration patterns.

Fences or barriers which are either too high to jump over, too low to crawl under or impenetrable can present problems, depending on the size of wild animals in the area. Animals may be injured or killed by loose or broken wires or by colliding with solid barriers, particularly when they are not easily visible.

Event security should carry out checks to prevent the illegal removal of wild plants or animals from the sports venue and impose penalties for offenders.

Contact between potentially dangerous wild animals (e.g. where a sports event is held in a protected or remote natural area) and people attending an event should be prevented, to safeguard both the lives of people and these animals. Vigilance and an effective warning system are needed.

Actions to take

The following table sets out actions for providers of outdoor security to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.4: Mitigating impacts of outdoor security on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid parking heavy vehicles or placing heavy equipment under or close to mature trees where they can damage surface roots.	All phases
Avoid cutting down trees or removing branches when erecting fencing or barriers.	Setting up
Disturbance or damage to wildlife	
Implement controls to ensure that staff, contractors, spectators and athletes do not leave the venue with illegally obtained wild animals or plants.	All phases
Be vigilant about, monitor where necessary, and alert people to the presence of potentially dangerous wild animals, and give athletes and spectators clear instructions on how to avoid confrontation or conflict with these animals.	All phases
Avoid erecting fencing or barriers in important areas for biodiversity (Box 1).	Setting up
Minimise wildlife collisions by erecting fences or barriers away from known movement routes (e.g. along rivers) and terrestrial, aquatic or marine habitat of threatened animal species.	Setting up
Include gaps in security fencing for wildlife or use permeable (e.g. rope, or stake and tape) barriers. The design and dimensions of these barriers should allow the passage of wild animals known to occur at or near the venue.	Setting up
Make sure that there are no loose or broken wires in fencing which could entangle or injure animals.	Setting up, staging event
Remove all fencing and barriers as soon as possible after the event.	Taking down
Introduction of alien invasive species	
Check that all vehicles transporting overlay and sports equipment (e.g. bicycles, watercraft) into the sports venue are free of soils and plant material which may contain and introduce seeds of alien invasive plants.	All phases

2.2.5. Outdoor lighting

Who should read this section?

- Lighting contractor
- The event organiser
- The overlay construction team
- The venue manager
- Field and grounds manager

Scope

Sports events may require outdoor lighting. Additional lighting could also be needed to set up or dismantle overlay outside daylight hours before and after the event, and to illuminate walkways or areas for sports teams, athletes and spectators.

Biodiversity objectives

- Avoid harm to important areas for biodiversity and known habitats of light-sensitive wild animals, in locating, setting up and removing outdoor lighting.
- Minimise disturbance to light-sensitive wildlife when operating lighting systems.

Biodiversity considerations and impacts

A major increase in light from usual levels can disturb and disorientate wildlife. This can be a particular problem at certain times of the year such as breeding or nesting seasons, especially for threatened or protected species.

Actions to take

The following table sets out actions for providers of outdoor lighting to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.5: Mitigating impacts of outdoor lighting on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid parking heavy vehicles or placing heavy equipment under or close to mature trees where they can damage surface roots.	All phases
Disturbance or damage to wildlife	
Use essential lighting only, avoid lighting along known or likely wildlife corridors (e.g. along watercourses), especially at night.	All phases
Use night lighting with a spectrum that does not disturb nocturnal wildlife. Avoid short wavelength 'blue' lights to minimise impacts on bats and insects.	All phases
Identify and implement ways to minimise light pollution within, and spreading from, the sports venue, e.g. through screening, or directional lighting.	All phases
Use shade or down lighting in areas known to be habitat for light-sensitive wild animals.	All phases
Use control systems, including timers to avoid using lights unnecessarily.	All phases
Remove all lighting as soon as possible after the sports event.	Taking down

2.2.6. Public service announcements, outdoor sound systems and noise

Who should read this section?

- Sound system contractor
- The event organiser
- The venue manager
- The overlay construction team
- Fields and grounds manager

Scope

Public service announcement (PSA) and outdoor sound systems can generate considerable noise at a sports event, above the level of the event itself.

Biodiversity objectives

- Avoid harm to important areas for conservation and habitats of noise-sensitive wildlife, in locating, setting up and removing equipment.
- Minimise disturbance to noise-sensitive wild animals in using sound or PSA systems.

Biodiversity considerations and impacts

A major increase in noise above background levels, as well as sudden and unpredictable bursts of noise, can disturb wildlife and be a problem particularly at certain times of the year such as breeding or nesting seasons.

Firework displays are common at sports events and can severely disturb wild animals^{63,64}; for example, creating panic, flight, stress and disorientation in nesting birds, resulting in collision with infrastructure, nest abandonment and failed breeding.

Some measures intended to reduce noise such as sound barriers could create further impacts which need to be addressed.

63 <https://academic.oup.com/beheco/article/22/6/1173/218852>

64 <https://www.rspb.org.uk/birds-and-wildlife/advice/how-you-can-help-birds/dangers-to-birds/fireworks-and-birds/#7XUriTReyaXQerJu.99>

Actions to take

The following table sets out actions for providers of outdoor sound systems to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.6: Mitigating impacts of outdoor sound systems on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid parking heavy vehicles or placing heavy equipment under or close to mature trees where they can damage surface roots.	All phases
Disturbance or damage to wildlife	
Locate sound systems away from habitats of wild animals known to be noise-sensitive, particularly protected or threatened species.	Setting up
Identify and implement ways to minimise noise pollution within and spreading from the sports venue. Erect sound barriers where significant noise or vibration is expected (e.g. from spectator crowds or the event itself) close to habitats of noise-sensitive or threatened wild animals, while ensuring that these barriers do not interfere with their movement.	Setting up, staging event
Prohibit the use of fireworks near protected areas, areas known to provide habitat for threatened or protected wild animals including roosting or nesting sites for birds.	Staging event
Restrict the volume on PSA systems, use sound-damping systems where necessary to reduce noise impacts, or reduce the volume on speakers close to habitats of noise-sensitive, threatened or protected animals.	Staging event
Remove all sound systems as soon as possible after the event.	Taking down

2.2.7. Broadcasting outdoors

Who should read this section?

- Broadcasters
- The event organiser
- The venue manager
- Field and grounds manager

Scope

Outdoor sports events are sometimes broadcast to audiences who are following the events remotely.

Biodiversity objectives

- Avoid harm to important areas for biodiversity in locating, setting up, moving and removing broadcasting equipment.

Biodiversity considerations and impacts

Broadcasters and their supporting film crews, with their equipment (e.g. camera, sound and lighting equipment and associated cabling, transmitters) and transport, can have a negative impact if they disturb or damage wildlife habitat, or cause erosion or compaction of soils.

Actions to take

The following table sets out actions for broadcasters, working outdoor, to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.7: Mitigating impacts of outdoor broadcasting on biodiversity

Guidance	Phase
Habitat loss or modification	
Use only roads, tracks or parking areas approved by the organising committee when transporting broadcasting equipment.	Setting up, staging event
Avoid parking heavy vehicles or placing heavy equipment under or close to mature trees where they can damage surface roots.	Setting up, staging event
Avoid the need to cut down trees or remove branches by adjusting the siting of broadcasting equipment.	Setting up, staging event
Always use previously disturbed or transformed areas for siting broadcasting equipment rather than clear areas of natural vegetation.	Setting up, staging event
Disturbance or damage to wildlife	
Walk the field of play before the event to ensure that broadcasting equipment and cameras are positioned away from important areas for biodiversity (Box 1) to avoid negative impacts and minimise the need for restoration or repair work.	Setting up
Remove all infrastructure as soon as possible after the event.	Taking down
Pollution	
Ensure that any waste is disposed of in bins provided.	Staging event

2.2.8. Solid and liquid waste management

Who should read this section?

- Waste management contractors
- The event organiser
- The venue manager
- Fields and grounds managers

Scope

Solid waste is generated during all phases of a sports event. Typically this comprises waste from overlay, catering and food, packaging, media and business centres, and discarded sporting equipment.

Liquid waste includes wastewater, fuels and oils, coolants, paints and other toxic or hazardous liquids which could be harmful to human health or the environment. It can be produced during all phases of the event, particularly in the form of sewage and grey water, but also as a result of accidental spills or leaks of oil or fuel from vehicles or machinery (e.g. generators) and from catering or kitchen products (e.g. plant oils). These wastes pose a threat to the health of aquatic and terrestrial ecosystems and the species that live in them.

Biodiversity objectives

- Avoid harm, both direct and indirect, to ecosystems and wildlife from the management and disposal of solid waste associated with a sports event.
- Prevent deterioration in ecosystem services as a result of waste disposal and pollution.

Biodiversity considerations and impacts

Solid waste generated at a sports event is likely to be disposed of at a landfill site where it can pollute groundwater, surface water and soils, harming wildlife habitat. Landfill also generates methane gas which contributes to greenhouse gas emissions and climate change.

Large solid waste such as abandoned equipment and packaging can kill or injure wild animals through entanglement or entrapment. Smaller solid waste (e.g. plastic that degrades into micro-particles) could be eaten by wild animals and move through the food chain with increasing toxicity, sickness and in some cases, death.

The ideal scenario would be to avoid disposing of solid waste altogether by reusing or recycling materials and composting organic matter where facilities are available (Box 21). No waste should be discarded in the natural environment and disposing waste in landfill or through incineration should be avoided where at all possible. All waste needs to be rigorously managed with enough clearly marked bins provided to allow it to be sorted.

Liquid waste such as grey water, sewage, fuels and oils, and other toxic or hazardous liquids disposed of in the natural environment can pollute terrestrial and aquatic ecosystems and their associated wildlife. Similarly, surface runoff from sports fields can release pesticides and fertilisers into natural ecosystems and affect their healthy functioning while winter sports events produce artificial meltwater and chemical runoff or dyes which can harm wildlife. Accidental spills of liquid waste on land and in water can cause serious harm.

All liquid waste must be contained, managed, treated and disposed of in a way that prevents ecosystem damage. Procedures should be put in place to respond to and clean up accidental spills immediately. Plenty of guidance exists on storing toxic or hazardous liquids, and emergency responses.

Actions to take

The following table sets out actions for providers of solid and liquid waste management to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.8: Mitigating impacts of solid and liquid waste on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid parking heavy vehicles or placing heavy waste management equipment under or close to mature trees where they can damage surface roots.	All phases
Disturbance or damage to wildlife	
Ensure that waste is stored properly to prevent access by – and subsequent harm to – wild animals. Use wildlife-proof bins.	All phases
Pollution	
Provide enough bins or skips and ensure that all waste generated by the event, from overlay, contractors, spectators, sports teams and athletes, is either reused, recycled or composted on site, where facilities exist, or disposed of at a licensed waste site. This includes discarded sports equipment (e.g. bullet casings, golf balls, clothing).	All phases
Provide suitable containers for disposing of used fuels or oils, and other potentially toxic liquid wastes.	All phases
Ensure the safe treatment and disposal of all medical waste at licensed disposal facilities and in line with regulations to prevent pollution and harm to wildlife.	All phases
Ensure that bins are emptied regularly to stop waste overflowing and spreading by wind or animals into the natural environment.	All phases
Provide suitable containers to collect and dispose of potentially toxic or hazardous materials to prevent surface water and groundwater pollution. Use licensed hazardous waste disposal sites.	All phases

Box 21: Managing waste at sports events

The drive for 'zero waste' focusses on reducing the volume and toxicity of waste and preferably eliminating it. This involves collecting and routing waste through eco-friendly channels for recycling, reusing, composting or providing material for other processes, rather than incineration or landfill.

1. The Gold Coast 2018 Commonwealth Games which drew about 1.2 million ticketed spectators and more than 6,600 athletes⁶⁵, trained 15,000 volunteers, 1,400 workers and contractors to collect rubbish and place it in the right bins. Spectators were encouraged to bring their own re-usable water bottles and water points were provided at the venue.
2. Since 2008, over 4,000 tonnes of waste generated during the US Open Tennis Tournament⁶⁶ has been diverted from landfill, saving over 4,000 tonnes of greenhouse gas emissions; the equivalent of 845 cars being driven for a year. This has been achieved through composting organic matter – about 600 tonnes of food waste has been turned into compost for gardens and farms along with over 100 tonnes of food being donated to local communities. All printed materials are composed of at least 30% post-consumer waste and enough recycled paper has been used to save over 1,400 trees.

65 <http://wastemanagementreview.com.au/commonwealth-games-waste/>

66 https://www.usopen.org/en_US/about/green_initiatives.html

2.2.9. Catering

Who should read this section?

- Catering contractors
- The event organiser
- The venue manager

Scope

The biodiversity impacts of providing food and drink at an event are similar to those of other service providers bringing in temporary infrastructure (clearing vegetation, compacting soils, producing waste and generating greenhouse gas emissions). Less tangible but equally important to address are the ingredients and origins of food and drink which may be sourced from suppliers that use unsustainable practices as outlined in section 1.3.

Biodiversity objectives

- Avoid contributing to biodiversity loss indirectly through the product supply chain by choosing sustainably sourced products.
- Avoid and minimise direct loss of biodiversity on site from catering activities.

Biodiversity considerations and impacts

Supplying a sports event with food and drink can generate extensive waste through litter discarded by consumers, and caterers disposing of food waste and packaging. Waste disposal has potentially major negative impacts on biodiversity as described in the previous section.

The supply chain for all food and drink, starting with their ingredients, is often associated with biodiversity loss through land use change such as through deforestation for agriculture, unsustainably sourced palm oil, and overexploitation of natural resources (e.g. over-fishing). Section 1.3 provides guidance on sustainable sourcing.

Actions to take

The following table sets out actions for caterers to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.9: Mitigating impacts of catering on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid parking heavy vehicles underneath or close to mature trees where they can damage surface roots.	Setting up, staging event
Soil erosion and compaction	
Ensure that heavy vehicles use hardstanding where possible and all vehicles stick to existing roads and tracks when delivering supplies.	Setting up, staging event
Pollution	
Minimise catering waste by avoiding or reducing packaging and recycling or re-using material where feasible.	Setting up, staging event

Dispose of all solid waste in bins provided at the venue to allow separation and processing through different channels.	Setting up, staging event
Ensure food products and waste are stored properly to prevent access by wild animals. Use wildlife-proof bins.	Setting up, staging event
Minimise food waste by matching supply with the expected number of people attending. ⁶⁷	Setting up, staging event
Store waste oil from catering in closed containers either for re-use or safe disposal. Oil used in food preparation should be re-used following health and safety standards.	Staging event, taking down
Donate any surplus edible food to employees, community programmes or charities rather than send it to landfill.	Staging event, taking down
Compost organic waste where facilities are available in the vicinity.	Staging event, taking down
Climate change and unsustainable sourcing	
Select suppliers with proven sustainability standards, including on sourcing, production and harvesting, and avoid CITES-listed species ⁶⁸ , and codes of conduct relating to biodiversity. Preferably source goods from certified eco-friendly sources.	Setting up, staging event
Use sustainably sourced, certified plant and animal products (e.g. fish from certified sustainable stocks that minimise threatened species by-catch) to minimise the conversion of wildlife habitats for food production.	Setting up, staging event
Source produce from local suppliers where possible to minimise transport impacts.	Setting up, staging event
Select materials and products with maximum recycled content to minimise the demand for natural resources.	Setting up, staging event
Avoid single-use and oxo-degradable plastic materials. Packaging should come from reused or recycled material or from verified sustainable sources. Choose re-usable or compostable utensils, cutlery and containers (e.g. bamboo) over disposable plastic goods such as cups and straws.	Setting up, staging event

67 The two most effective approaches to reducing greenhouse gases and energy use associated with waste, and striving for 'zero waste', are eliminating edible food waste and recycling. <http://www.mdpi.com/2071-1050/9/7/1236/pdf>.

68 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) aims to protect endangered plants and animals by controlling trade in (import, export or re-import of) the live or dead organisms themselves and/or products made from them. There are three CITES appendices stipulating different levels of control depending on the level of threat to these species. <https://www.cites.org/eng/disc/how.php>

2.2.10. Transport and on-site traffic management

Who should read this section?

- Transport management contractor
- The event organiser
- The venue manager
- Fields and grounds management

Scope

Sports events generate an increase in traffic from contractors, teams and athletes, spectators and other service providers during set up, the event itself, and the taking-down phase.

Biodiversity objectives

- Avoid harm, both directly and indirectly, to ecosystems and species from transport and traffic associated with a sports event.

Biodiversity considerations and impacts

The type of transport, as well as the volume and movement of vehicles, can affect biodiversity. Different modes of transport have different implications in terms of ecosystem damage, fuel and energy use, emissions, pollution and noise. The effects of vehicular traffic can include direct impacts (e.g. animal strikes leading to injury or death), localised indirect impacts (e.g. noise disturbance) and wider indirect impacts such as air pollution and contributions to climate change, both of which have major implications for biodiversity.

Providing parking areas at the venue can modify natural areas while vehicles driven off official routes may damage natural vegetation and cause erosion or soil compaction.

Actions to take

The following table sets out actions for transport service providers and on-site traffic management to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.10: Mitigating impacts of transport and on-site traffic on biodiversity

Guidance	Phase
Habitat loss or modification	
Avoid using heavy vehicles in important areas for biodiversity – areas known to support populations of wild animals and plants, areas that can be easily destabilised like riverbanks, shorelines and sand dunes, and freshwater habitats and wetlands (Box 1).	All phases
Ensure that heavy vehicles do not park on ground under or close to mature trees where they can damage surface roots.	All phases
Make sure all vehicles use only marked roads, tracks and parking areas approved by the venue manager or event's organising committee.	All phases
Disturbance or damage to wildlife	
Apply strict speed limits to minimise the risk of wildlife collisions.	All phases
Limit traffic at dawn and dusk, at night and during times of peak activity of protected or threatened animal species where feasible.	All phases

Introduction of alien invasive species	
Keep all vehicles transporting overlay, sports teams and athletes, and sporting equipment free of soil, plant material and seeds from outside the area, to prevent the introduction of alien invasive plants to the venue.	All phases
Soil erosion and compaction	
Avoid using vehicles in erosion-prone soils (e.g. riverbanks, shorelines, sand dunes, and freshwater habitats).	All phases
Limit heavy vehicles to clearly marked areas and hardstanding.	All phases
Pollution	
Immediately report any accidental fuel spills to the event organiser, venue manager and liquid waste management contractor to ensure pollution is contained and cleaned up quickly.	All phases
Climate change and unsustainable sourcing	
Encourage the use of public transport (trains, buses, trams, shuttles), pedestrian routes and bicycles.	Staging event

2.2.11. Outdoor spectator management

Who should read this section?

- Spectator managers
- The event organiser
- The venue manager

Scope

This section covers potential impacts caused by the presence, movement and behaviour of spectators at a sports event.

Biodiversity objectives

- Avoid harm being caused by spectators, either intentionally or unintentionally, to wildlife and important areas for biodiversity.
- Minimise impacts on natural ecosystems and wildlife due to the presence, movement and behaviour of spectators.

Biodiversity considerations and impacts

The presence of large numbers of spectators at sports events, although an opportunity to boost awareness of biodiversity, can lead to a range of negative impacts. For outdoor events, these could include direct damage to ecosystems and wildlife habitat, introduction of alien and invasive organisms or pathogens, noise and light pollution, waste generation and increased fire risk.

Less obvious, indirect impacts include the increased use of water, energy and other natural resources for the event. There is clearly a need to manage spectators carefully at outdoor events, particularly in natural and modified landscapes but also in urban environments (Box 22).

Box 22: Protecting important areas for biodiversity – the London Olympics⁶⁹

Measures taken to reduce impacts on important habitats during the 2012 Olympic Games included:

- Metal crowd barrier fencing placed around key areas of extremely fragile habitat;
- Stake and tape-type 'fencing' used along habitat areas where crowd pressure was anticipated to be less intense;
- Educational signage along metal barrier lines, on stakes in woodland areas; and
- Briefing event stewards on habitat protection measures.

The combination of barriers, signage and information led to a vast majority of spectators respecting the protection measures.

Actions to take

The following table sets out actions for managers of outdoor spectators to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

⁶⁹ Chapman and Duffus 2012.

Table 2.2.11: Mitigating impacts of outdoor spectators on biodiversity

Guidance	Phase
Habitat loss or modification	
Brief stewards and volunteers before the event to ensure they are fully informed about the need for spectators to stay away from marked 'no go' areas to avoid trampling of vegetation and loss of habitat.	Setting up
Ensure that spectators do not access, trample or otherwise damage vegetation in, 'no go' areas or important areas for biodiversity.	Staging event
Disturbance or damage to wildlife	
Brief stewards and volunteers before the event to ensure they are fully informed about 'dos and don'ts' (e.g. avoiding marked 'no go' areas, no removal of wild animals or plants, no discarding of waste in the natural environment, and no feeding of wild animals).	Setting up
Provide a vegetation buffer between important areas for biodiversity (Box 1) and spectator areas.	Setting up
Use signs, information boards and clear route marking to guide spectators along approved routes and keep them away from important habitat, wildlife that is sensitive to noise and disturbance, and known breeding or nesting sites.	Setting up, staging event
Use signage and information materials to help foster an interest in the venue's natural environment and its biodiversity. Explain any restrictions on access or behaviour.	Setting up, staging event
Ensure there is no interference with or removal of temporary barriers, cables, wires or fencing erected to manage spectators and prevent movement into important areas for biodiversity.	Staging event
Prohibit the removal of wild plants and animals by spectators and implement penalties for offences, either civil or criminal depending on the circumstances.	Staging event
Prohibit the feeding of wild animals by spectators, supported by appropriate consequences or penalties for offenders.	Staging event
Soil erosion and compaction	
Guide spectators away from areas that are prone to erosion (e.g. riverbanks, shorelines and steep slopes) to avoid moving sediments into freshwater ecosystems and degrading habitat.	Setting up, staging event
Pollution	
Ensure that spectators use bins to separate and dispose of all waste for re-use, recycling or composting. No waste should be discarded in the natural environment.	Staging event
Climate change and unsustainable sourcing	
Encourage spectators to use accommodation that is close to the venue, within walking distance or close to public transport routes.	Setting up
Encourage spectators to use public transport (trains, buses, trams, shuttles), pedestrian routes, bicycles and/or fossil fuel-free vehicles where feasible, to reduce traffic and greenhouse gas emissions.	Setting up, staging event

2.2.12. Management of sports teams

Who should read this section?

- Sports teams managers
- The event organiser
- The venue manager

Scope

The presence, numbers and behaviour of sports teams, comprising athletes and their support people – trainers, coaches, medics and so on – can affect biodiversity in several ways, particularly in outdoor events.

Biodiversity objectives

- Avoid harm to important areas for biodiversity.
- Minimise impacts on natural ecosystems and wildlife due to the presence, movement and behaviour of sports teams.

Biodiversity considerations and impacts

Sports teams and athletes can affect biodiversity both positively and negatively. They can raise awareness of biodiversity and champion conservation, or harm wildlife directly or indirectly. This could be by taking wild plants or animals from a site, increasing the risk of fire (e.g. by discarding a lit cigarette), unintentionally introducing alien, invasive plants or animals (e.g. insect eggs on equipment), or causing pollution. Any equipment and materials discarded in natural environments can cause injury or death to animals and should be re-used, recycled, or disposed of responsibly. Transporting sports teams and athletes can also generate a range of negative impacts as covered in previous sections.

Actions to take

The following table sets out actions for managers of sports teams to mitigate impacts on biodiversity. The first column groups these actions within areas of potential impact on biodiversity, as described in Table 1, Part 1 of these guidelines. The second column indicates the phase of the event in which the action should be taken.

Table 2.2.12: Mitigating impacts of sports teams on biodiversity

Guidance	Phase
Habitat loss or modification	
Ensure that large team vehicles such as coaches do not park under or close to mature trees where they can damage surface roots.	Setting up, staging event
Ensure that athletes do not access, trample or otherwise damage vegetation in, 'no go' areas or important areas for biodiversity.	Staging event
Disturbance or damage to wildlife	
Encourage all athletes to act as biodiversity champions, sending positive messages to fans and spectators to help conserve wildlife.	All phases
Encourage all athletes to respect natural areas, avoid disturbing or feeding wild animals, or endangering them by littering.	Setting up, staging event
Provide athletes with venue maps showing approved movement routes and 'no go' areas, explaining why important areas for biodiversity must be avoided.	Setting up, staging event

Provide teams with 'dos and don'ts' (Box 23) regarding the venue's natural environment.	Setting up, staging event
Carry out an on-site briefing of teams to reinforce the information on the sensitivity of the area with regard to wildlife, and expected conduct.	Setting up, staging event
Prohibit the removal of wild plants and animals, supported by appropriate consequences or penalties for offenders.	Setting up, staging event
Prohibit the feeding of wild animals by athletes, supported by appropriate consequences or penalties for offenders.	Staging event
Introduction of alien invasive species	
Keep equipment (bicycles, watercraft etc.) and clothing free of soil and plant material when moving from one area to another, to prevent the accidental introduction of alien invasive plant or animal species.	Setting up, staging event
Distribute guidance on what to do to prevent the transport and spread of 'hitchhiker' pests.	Setting up, staging event
Pollution	
Where possible, make sure athletes' equipment and clothing does not contain toxic or hazardous materials (e.g. silver compounds and fluorinated chemicals in some textiles). Substitute these materials with harmless and biodegradable alternatives where feasible.	Setting up, staging event
Prohibit the use of anti-fouling paints and products on water sports equipment. These products inhibit growth of algae and other organisms on watercraft but may contain copper, zinc, arsenic, mercury, tin compounds, and other chemicals (biocides) which are toxic to aquatic wildlife.	Setting up, staging event
Ensure all waste is put in bins and separated for re-use, recycling, or composting. No waste should be discarded into the natural environment.	Setting up, staging event
Collect all used, damaged and discarded sporting equipment to prevent contamination of land or water habitats and channel it for re-use, recycling or safe disposal a licensed waste site.	Staging event, taking down
Climate change and unsustainable sourcing	
Encourage teams to use accommodation that is close to the venue, within walking distance or close to public transport routes.	Setting up
Encourage the use of public transport or fossil fuel-free vehicles to reduce traffic and greenhouse gas emissions.	Setting up, staging event

Box 23: Example of a simple 'dos and don'ts' leaflet for sports teams



Do's and don'ts



- Do act as a biodiversity champion: help spread the conservation message to protect wildlife for future generations
- Do respect 'no go' areas with important wildlife and stick to demarcated routes
- Do make sure your equipment and clothing is kept free of 'hitchhikers' – pest plants or animals
- Do use the waste bins for all wastes to prevent pollution of natural systems and danger to wild animals
- Don't throw your rubbish or broken equipment into nature – re-use or recycle
- Don't intentionally pick, remove or destroy plants
- Don't disturb, harm or remove wild animals
- Don't feed wild animals
- Don't use single-use plastics such as water bottles or wrapping for equipment to minimize pollution of natural systems and danger to wild animals



3. Useful links, sources and materials

3.1 Sustainable sport and sports events

Fédération Equestre Internationale (FEI). 2014. *Sustainability Handbook for Event Organisers*. https://inside.fei.org/system/files/FEI_Sustainability_Handbook_for_Event_Organisers.pdf.

Green Sports Alliance. <http://www.Greensportsalliance.org/>

International Olympic Committee (IOC). 2018. *Sustainability Essentials: A series of practical guides for the Olympic movement*. https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/What-We-Do/celebrate-olympic-games/Sustainability/sustainability-essentials/IOC-Sustain-Essentials_v7.pdf.

— IOC (2018). *Sustainability Essentials 2: Sports for climate action*. In collaboration with UN Climate Change, Global Climate Action. <https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/What-We-Do/celebrate-olympic-games/Sustainability/sustainability-essentials/SUSTAINABILITY-ESSENTIALS-ISSUE-2.pdf>

— IOC (1997, 2005). *Manual on sport and the environment*. <https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/Documents/Olympism-in-Action/Environment/Manual-on-Sport-and-the-Environment.pdf>.

— IOC (2007). *IOC guide to sport, environment and sustainable development*. <https://www.olympic.org/news/ioc-guide-to-sport-environment-and-sustainable-development>.

International Standards Organisation (ISO) (2012). ISO 20121:2012. *Event sustainability management systems – requirements with guidance for use*. <https://www.iso.org/iso-20121-sustainable-events.html>.

Natural Resources Defense Council (NRDC) (2012). *Game Changer: How the sports industry is saving the environment*. <https://www.nrdc.org/resources/game-changer-how-sports-industry-saving-environment>

Sport and Sustainability International. <http://www.sandsi.org/#/home>. <http://www.sandsi.org/#/knowledge-center>

Vancouver 2010 and International Academy of Sport Science and Technology (AISTS). *Sustainable Sport and Event Toolkit*.

<http://www.sustainableinnovationinsport.org/news-and-updates/vancouver-2010-aists-sustainable-sport-and-event-toolkit-sset>

World Sailing 2016. *Sustainability Agenda 2030*. Ratified May 2018. [http://www.sailing.org/tools/documents/SustainabilityAgenda2030-\[23247\].pdf](http://www.sailing.org/tools/documents/SustainabilityAgenda2030-[23247].pdf)

World Wide Fund for Nature (WWF) and Union of European Football Associations (UEFA), with the support of Green Sports Alliance (2018). *Playing for our Planet: how sports win from being sustainable*. https://www.uefa.com/MultimediaFiles/Download/uefaorg/General/02/55/63/72/2556372_DOWNLOAD.pdf

3.2 Sports and sports events that consider biodiversity

Commonwealth Secretariat (2017). *Enhancing the Contribution of Sport to the Sustainable Development Goals*. Authors: Iain Lindsey and Tony Chapman. Commonwealth Secretariat, London. https://www.sportanddev.org/sites/default/files/downloads/enhancing_the_contribution_of_sport_to_the_sustainable_development_goals_.pdf

Fédération Equestre Internationale (FEI) (2014). *Sustainability Handbook for Event Organisers*. https://inside.fei.org/system/files/FEI_Sustainability_Handbook_for_Event_Organisers.pdfhttps://inside.fei.org/system/files/Code_of_Conduct_Welfare_Horse_1Jan2013.pdf

Golf Environment Organisation (GEO) (2017). *Sustainable Golf Development Guidelines*. http://www.golfenvironment.org/assets/0004/7963/GEO_Dev_Guide_Web.pdf

Golf Environment Organisation (GEO) (2017). *Voluntary Sustainability Standard for Golf Development*, plus Handbook (this Voluntary Standard underpins golf course certification). <http://www.golfenvironment.org/vision/action/standards/developments>

International Mountain Bicycling Association. *Guidelines for a Quality Trail Experience: mountain bike guidelines*. https://www.imba.com/sites/default/files/GQTE_Digital_Book_Rev_6.11.18_high_res.pdf

<https://www.imba.com/explore-imba/resource-hub>

International Olympic Committee (IOC) (2016). Sustainability strategy. <https://www.olympic.org/sustainability>

International Ski Federation (FIS) (2017). *Environmental guidelines for Sustainable FIS World Championships*. https://assets.fis-ski.com/image/upload/v1538570520/fis-prod/Environmental_Guidelines_for_Sustainable_FIS_World_Championships.pdf

FIS (2013). *Green Events: Environmental Guide of the International Ski Federation*. https://assets.fis-ski.com/image/upload/v1537433712/fis-prod/assets/FIS_Green_Event_Manual_EN.pdf

ISA (International Rowing Federation) 2012. *Environmental sustainability policy and guidelines*. http://www.worldrowing.com/mm/Document/General/General/12/22/76/FISAEnvironmentalSustainabilityPolicyandGuidelines_English_Neutral.pdf

International Water Ski Federation. *Environmental Handbook for Towed Water Sports*. <http://www.iwsf.com/EnvironmentalHandbook/iwsfecpartb.htm>

National Ski Areas Association, Sustainable Slopes initiative and charter. http://www.nsaa.org/media/131146/Environmental_Charter.pdf <http://www.nsaa.org/environment/sustainable-slopes/>

Royal Yachting Association, British Marine, Sailing Networks and Sunsail. *The Green Blue*. <https://www.thegreenblue.org.uk/>

Sport and Sustainability International. <http://www.sandsi.org/#/home> Sport England 2007. *Environmental Sustainability: promoting sustainable design for sport*. <https://www.sportengland.org/media/4213/environmental-sustainability.pdf>

The Initiative for Global Environmental Leadership, Natural Resources Defence Council and Green Sports Alliance 2013. Special Report: *The Green Sports Movement*. <http://knowledge.wharton.upenn.edu/article/reducing-sports-impact-environment/>

World Sailing 2016: *Sustainability Agenda 2030*, ratified May 2018. [http://www.sailing.org/tools/documents/SustainabilityAgenda2030-\[23247\].pdf](http://www.sailing.org/tools/documents/SustainabilityAgenda2030-[23247].pdf)

3.3 Wild animal-friendly fencing, wiring and barriers

Eskom (Electricity Supply Commission, South Africa) 2008. *Transmission Bird Collision Prevention Guideline*. <http://migratorysoaringbirds.undp.birdlife.org/sites/default/files/APPENDIX%205%20Eskom%20Collision%20Guideline.pdf>

Huijser MP, Kociolek AV, Allen TDH, McGowen P. 2015. *Construction guidelines for wildlife fencing and associated escape and lateral access control measures*. http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25%2884%29_FR.pdf

Montana Fish, Wildlife & Parks. Author: Christine Paige, Ravenworks Ecology. *A Landowner's Guide to Wildlife Friendly Fences: How to build fences with wildlife in mind*. https://defenders.org/sites/default/files/publications/wildlife_friendly_fences_2008.pdf

3.4 Ecological restoration

Keenleyside, K.A., Dudley, N., Cairns, S., Hall, C.M., and Stolton, S. (2012). *Ecological Restoration for Protected Areas: Principles, Guidelines and Best Practices*. Best Practice Protected Area Guidelines Series, no. 18. Gland, Switzerland: IUCN. <https://portals.iucn.org/library/node/10205>

Society for Ecological Restoration. 2000. Guidelines for developing and managing ecological restoration. https://www.ctahr.hawaii.edu/LittonC/PDFs/682_SERGuidelines.pdf

3.5 Ecological monitoring

Werner, Florian A. & Gallo-Orsi, Umberto. 2016. *Biodiversity Monitoring for Natural Resource Management. An Introductory Manual*. GIZ, Eschborn and Bonn, Germany. https://www.researchgate.net/publication/303814279_Biodiversity_Monitoring_for_Natural_Resource_Management_An_Introductory_Manual

3.6 Sustainable sourcing and procurement

Aquaculture Stewardship Council. Sustainable seafood certification. <https://www.asc-aqua.org/>

Better Cotton Initiative. Better Cotton Standard System. <https://bettercotton.org/about-better-cotton/better-cotton-standard-system/>

Campelli, M. 2018. Sustainable procurement for sports events: Lessons from London 2012. <https://sportsustainabilityjournal.com/analysis/sustainable-procurement-for-sports-events-lessons-from-london-2012/>

Cumming, P., Stubbs, G. and Walsh, D. 2012. Sustainable procurement - the London 2012 Olympic Games and Paralympic Games. Learning Legacy. Lessons learned from planning and staging the London Games. <http://learninglegacy.independent.gov.uk/themes/procurement/case-studies.php>

Environmental Protection Agency (EPA), USA. Green Sports: for stadiums, events and leagues. Guidance on use of greener products, environmentally preferable purchasing, water conservation etc. <https://www.epa.gov/green-sports/stadiums-events-and-leagues#greener>.

Forest Stewardship Council certification. <https://ic.fsc.org/en/what-is-fsc-certification>

Global Coffee Platform. <https://www.isealalliance.org/community-members/global-coffee-platform-gcp>

Global Roundtable for Sustainable Beef (certification for farmers, companies and products) <http://www.grsbeef.org/what-sustainable-beef>

Green Seal Certification. Green Seal develops Environmental Leadership Standards to help manufacturers, purchasers and consumers make responsible choices. <http://www.greenseal.org/GreenBusiness/Certification/WhyCertification.aspx>.

International Olympic Committee (IOC). 2019. *Sustainability Essentials Issue 3: Sustainable sourcing in sport*. <https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/IOC/What-We-Do/celebrate-olympic-games/Sustainability/sustainability-essentials/SUSTAINABILITY-ESSENTIALS-ISSUE-3.pdf>

International Olympic Committee (IOC). 2019. *Olympic Games Guide on Sustainable Sourcing*. April 2019. s

ISEAL Alliance. Sustainability Standards. <https://www.isealalliance.org/working-partnership/sustainability-standards>; <https://www.isealalliance.org/innovations-standards/innovations-projects/iseal-certification-atlas-putting-certified-sites-map>

Marine Stewardship Council. Sustainable seafood certification. <https://www.msc.org/>

Programme for the Endorsement of Forest Certification. Sustainable forest management certification. <https://www.pefc.org/>

Rainforest Alliance. Certification of forest and farm products (including chocolate, tea, palm oil, coffee, bananas, beef, paper and soap). <https://www.rainforest-alliance.org/find-certified>

Roundtable on Sustainable Palm Oil. <https://www.rspo.org/about>

Roundtable on Responsible Soy. <http://www.responsiblesoy.org/?lang=en>

Roundtable on Sustainable Biomaterials. <http://rsb.org/certification/>

UTZ certified cocoa, coffee and tea, hazelnuts. <https://www.utz.org/what-we-offer/certification/>

Waste and Resources Action Programme. Reducing waste. <http://www.wrap.org.uk/>

3.7 Reporting on performance

Global Reporting Initiative (GRI) Event Supplement. <https://www.globalreporting.org/Documents/ResourceArchives/GRI-G4-Event-Organizers-Sector-Disclosures.pdf>

Biodiversity: A GRI Reporting Resource. <https://www.globalreporting.org/resourcelibrary/Biodiversity-A-GRI-Resource-Document.pdf>

3.8 Biodiversity information on important biodiversity areas

BirdLife International Data Zone

Important Bird and Biodiversity Areas. <http://datazone.birdlife.org/home;www.birdlife.org/datazone/site>

Endemic Bird Areas. <http://datazone.birdlife.org/ebas>

Soaring Bird Sensitivity Maps. <http://migratorysoaringbirds.undp.birdlife.org/en/sensitivity-map>

Integrated Biodiversity Assessment Tool (IBAT). <https://www.iucn.org/regions/washington-dc-office/our-work/ibat-business>

IUCN. IUCN Red List of Threatened Species: <http://www.iucnredlist.org/>; <https://www.iucn.org/resources/conservation-tools/iucn-red-list-threatened-species>

UN Environment World Conservation Monitoring Centre's 'biodiversity a-z' website. Includes information on protected areas, Important Plant Areas, Key Biodiversity Areas, Ramsar sites etc. <http://www.biodiversitya-z.org/>

Alliance for Zero Extinction: <http://www.biodiversitya-z.org/content/alliance-for-zero-extinction-sites-aze>.

Important Bird and Biodiversity Areas: <http://www.biodiversitya-z.org/content/important-bird-and-biodiversity-areas-iba>.

Important Plant Areas. <http://www.biodiversitya-z.org/content/important-plant-areas-ipa>

Key Biodiversity Areas: <http://www.biodiversitya-z.org/content/key-biodiversity-areas-kba>

High Conservation Value Areas: <http://www.biodiversitya-z.org/content/high-conservation-value-areas-hcva>.

Indigenous and Community Conserved Areas: <http://www.biodiversitya-z.org/content/indigenous-peoples-and-community-conserved-territories-and-areas-icca>.

World Database of Key Biodiversity Areas. <http://www.keybiodiversityareas.org/home>. Key Biodiversity Areas™, managed by BirdLife International on behalf of the KBA Partnership, includes an interactive online map of KBAs with links to documentation for each site.

World Database on Protected Areas (WDPA). <https://www.protectedplanet.net/c/world-database-on-protected-areas>. A joint project between UN Environment Programme and IUCN. Compilation and management of the WDPA is carried out by the UNEP World Conservation Monitoring Centre (UNEP-WCMC). Covers international, regional, and national protected areas.



References

- Blankenbuehler, M. and Kunz, M.B. (2014). 'Professional Sports Compete to Go Green'. *American Journal of Management* vol. 14(4). http://digitalcommons.www.na-businesspress.com/AJM/BlankenbuehlerM_Web14_4_.pdf
- Brownlie, S. (2019). *Mitigating biodiversity impacts of new sports venues*. Gland, Switzerland: IUCN. <https://doi.org/10.2305/IUCN.CH.2019.02.en>
- Chapman, K. and Duffus, J. (2012). *Learning legacy: Lessons learned from the London 2012 Games construction project. Habitat protection during the Games*. <https://webarchive.nationalarchives.gov.uk/20180426101359/http://learninglegacy.independent.gov.uk/>
- International Olympic Committee (IOC) (2017). *Sustainability Strategy: Executive Summary*. <https://stillmed.olympic.org/media/Document%20Library/OlympicOrg/Factsheets-Reference-Documents/Sustainability/2017-03-21-IOC-Sustainability-Strategy-English-01.pdf>
- Organisation for Economic Cooperation and Development (OECD) (2016). *Organising sporting events: preventing corruption and promoting responsible business conduct*. <http://www.oecd.org/corruption/Corruption-Responsible-Business-Conduct-Large-Sporting-Events.pdf>
- Trendafilova, S., McCullough, B., Pfahl, M., Nguyen, S.N., Casper, J. and Picariello, M. (2014). 'Environmental sustainability in sport: Current state and future trends'. *Global Journal on Advances in Pure & Applied Sciences* [Online]. 2014, 03, pp 09-14. Available from: <http://www.world-education-center.org/index.php/paas>
- World Wide Fund for Nature (WWF) and Union of European Football Associations (UEFA, with the support of Green Sports Alliance (2018). *Playing for our Planet: how sports win from being sustainable*. https://www.uefa.com/MultimediaFiles/Download/uefaorg/General/02/55/63/72/2556372_DOWNLOAD.pdf





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