

Species and Habitat Conservation— Industry Fundamentals

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Introduction

The species and habitat conservation fundamentals presented in this bulletin are processes and practices used by the oil and natural gas industry to manage potential risks of project-related impacts on wildlife and habitats while responsibly developing the nation's oil and natural gas resources. The industry employs a wide variety of operational practices in conjunction with environmental site screening and baseline environmental surveys to identify and mitigate adverse impacts during the exploration and production project life cycle. These processes and practices represent a continuously improving evolution of industry's exploration and production activities with regard to species and habitat conservation.

Oil and natural gas operators' business management efforts during exploration and development activities inherently support effective species and habitat conservation practices by emphasizing extensive planning and scheduling. Industry has adopted the key concepts of the mitigation hierarchy into its business planning and operating practices; however, to be most effective in applying species and habitat conservation practices, the regulatory policies and requirements addressing conservation should be fit for purpose, readily allow innovation, and, to the extent possible, encourage voluntary actions by operators and landowners.

Operators should foster broad stakeholder engagement through every phase of project development, and should include land and mineral owners, state and federal regulatory and wildlife agencies, and the public in the communities where oil and natural gas operations occur. Oil and natural gas development activities should be aligned with local and regional concerns and grounded in responsible practices and lessons learned from species and habitat conservation experience.

Species and Habitat Conservation—Industry Fundamentals

1 Scope

This bulletin is intended to provide oil and natural gas operators with information on conservation measures to support planning and execution of onshore oil and natural gas projects in the United States for conventional and unconventional (shale) developments. The processes and practices described herein are aimed primarily at industry professionals responsible for managing the potential risks of project impacts on biodiversity, but may also be used by contractors, sub-contractors, and vendors. The benefits of employing consistent conservation practices include increased conservation efficiency and stakeholder acceptance.

Oil and natural gas operators acknowledge that activities associated with the development of oil and natural gas resources have the potential to impact wildlife and habitats. These activities can include, but are not limited to, field exploration and production work (such as geophysical and seismic surveys), drilling operations, well completion activities, operations/production activities, construction of well production facilities and related infrastructure, and produced water management facilities.

This bulletin provides flexible and adaptable strategies, acknowledging that the application will vary between operators and environmental settings. Many operators already apply the same or similar practices or processes within their operations. The use of this bulletin is at each individual operator's discretion.

This document provides a brief explanation of the typical technology, practices, and processes employed by the oil and natural gas industry to identify, explore, develop, and produce hydrocarbon resources. Conservation processes and practices used by the oil and natural gas industry are discussed in more detail.

This document provides general discussion of exploration, construction, development, production, and facilities operations, but does not provide an extensive discussion of applicable local, state, and federal regulatory requirements. It is the responsibility of the operator to review local, state, and federal regulatory requirements applicable in their areas of operation, and, if needed, consult with third parties that have appropriate regulatory, scientific, technical, and legal expertise. Operators should consider referencing other available industry standards and guidance that can provide additional information.

In addition to this document, API has developed other environmentally related standards specifically applicable to shale development, including:

- API 51R ^[1], an environmental guidance document for use by the oil and natural gas industry;
- API 100-1 ^[2], which contains recommended practices for well construction and fracture stimulation design and execution as it relates to well integrity, groundwater protection, and fracture containment for onshore wells;
- API 100-2 ^[3], which contains recommended practices regarding the management of the environmental aspects of shale development during planning site selection; logistics; mobilization; rig-up; demobilization; and well stimulation operations;
- API 100-3 ^[4], which contains recommendations for engaging the communities where oil and natural gas development occurs.

2 Normative References

This document contains no normative references.

3 Terms, Definitions, and Abbreviations

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

anti-perching devices

Technologies that reduce the roosting and nesting of larger birds.

EXAMPLE Raptors.

3.1.2

at-risk species

A species listed in the Endangered Species Act; a species that is a candidate for listing in the Act; a species that is unlisted but whose population is declining; or a species identified by states as a “species of greatest conservation need.”

3.1.3

baseline condition(s)

The physical, chemical, biological, social, economic, regulatory, and/or cultural setting in which the proposed project is to be located, and where local impacts (both positive and negative) can be expected to occur.

3.1.4

biodiversity

The variability among living organisms from all sources, including, among other things, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and among ecosystems ^[1].

NOTE This term can be used more specifically to refer to all of the species in one region or ecosystem.

3.1.5

closed-loop system

A process that cycles and confines fluids required or produced during the drilling process.

NOTE This technique eliminates the need for reserve pits to hold drilling fluids.

3.1.6

common corridors

Linear areas in an oil or natural gas field where roads, pipes, and transmission lines are concentrated to minimize disturbance.

3.1.7

compensatory mitigation

The offsetting of surface impacts at a mineral development site by preservation, restoration, enhancement, or an in-lieu fee to establish a habitat of approximately equivalent value at another location.

3.1.8

cooperative agreement

A voluntary conservation agreement between a government or quasi-government entity and a private entity, or between private entities.

3.1.9

data quality parameters

Data features that can be quantified or assessed with defined standards (e.g. accuracy, completeness, consistency, etc.) to ensure statistical strength of data analysis.

3.1.10**directional drilling**

A drilling technique that intentionally deviates from a vertical orientation to guide the wellbore to a subsurface target (see 3.1.23, horizontal drilling).

3.1.11**disturbance**

An event of environmental stress occurring over time and spatial scales that alters an affected ecosystem.

3.1.12**ecosystem**

The dynamic complex of the biotic (living plant, animal, and microorganism communities) and the abiotic (non-living) environment interacting as a functional unit.

3.1.13**ecosystem services****BES**

The benefits that ecosystems contribute toward human well-being.

NOTE Ecosystem services can be divided up into four categories:

- a) provisioning services: products or goods, such as water, food, or timber;
- b) regulating services: ecosystem functions, such as flood control and climate regulation;
- c) cultural services: non-material benefits, such as recreational, aesthetic, and spiritual benefits; and
- d) supporting services: fundamental processes, such as nutrient cycling and photosynthesis, that support the above three categories ^[2].

3.1.14**enhancement**

A conservation activity that improves the quality of habitat.

3.1.15**environmental risk**

An actual or potential threat of adverse effects on living organisms and the environment by effluents, emissions, wastes, resource depletion, etc., arising out of an organization's activities.

3.1.16**environmental site screen**

An iterative planning process of (desktop and field) data gathering, analysis, and informed decision-making.

3.1.17**field**

A geographic area with identified boundaries that has commercial petroleum deposits.

NOTE Most commonly references an area that is already in the production phase.

3.1.18**fragmentation**

A process by which large and contiguous habitats become divided into smaller or isolated habitats.

NOTE The creation of these smaller habitats can impact the species using the habitats and their community structure.

3.1.19**geographic information systems****GIS**

A computer system that allows for the storage, capture, analysis, and illustration of geographic spatial data.

3.1.20**geophysical**

Subsurface rock layers and structure that identify mineral reservoirs contained within the rock structures and layers.

3.1.21**habitat**

A geographic area, either occupied or not occupied by the species, on which (1) physical and biological features are found that are necessary to support long-term survival of the species during the species' life stages that occur in that area, and on which (2) the species can survive through successive generations during the species' life stages that occur in that area.

3.1.22**habitat type**

Describes a set of biotic and abiotic features on a landscape on varying levels of scale.

3.1.23**horizontal drilling**

A directional drilling technique where the wellbore deviation from vertical exceeds 80 degrees.

NOTE This technology allows operators to access oil or natural gas reservoirs that occur a distance away from the well site, resulting in reductions of operational footprint, especially when multiple horizontal wells are installed at a single pad location.

3.1.24**hydraulic fracturing**

A completion or workover technique used to recover oil or natural gas in low-permeability reservoirs.

NOTE Fracturing fluids are pumped into the well under pressure at designed rates to expand openings in the subsurface geology, resulting in increased hydraulic conductivity.

3.1.25**hydrocarbons**

Compounds of hydrogen and carbon that occur in crude oil and natural gas.

3.1.26**landscape level approach**

A development strategy to reduce the risk of cumulative surface impacts to ecosystems, or special habitat areas of larger geographic scale, and the services they provide.

3.1.27**listed species**

A species federally listed as threatened or endangered under the ESA.

NOTE A "state listed" species is warranted for management prescribed by and within that state.

3.1.28**mineral**

Commercially salable materials, such as oil, condensate, and natural gas.

3.1.29**mitigation**

Projects, programs, processes, or practices intended to lessen identified impacts to an existing historic or natural resource, such as wildlife and habitats.

3.1.30**mitigation hierarchy**

The sequence of actions to anticipate and avoid, and where avoidance is not possible, minimize, and, when impacts occur, restore, and where significant residual impacts remain, offset for biodiversity-related risks and impacts on affected communities and the environment.

3.1.31**monitoring**

Activities that characterize and document the condition of a project site to establish baseline and trend data that may include wildlife, plants, soil, air, or water.

3.1.32**multi-well pad**

An oil or natural gas location (pad) with more than one well.

3.1.33**operator**

The company, whether representing itself or another, such as on behalf of a joint venture or other operating agreement, that handles the day-to-day operations for maintaining and producing an oil and gas property.

3.1.34**priority species**

A species that has been selected due to concerns over its long-term survival, warranting management efforts to conserve.

3.1.35**project region**

An area of land that encompasses an oil and natural gas development.

3.1.36**reclamation**

Returning land to baseline condition or another land-use objective.

3.1.37**sensitive receptor**

Species or organisms, populations, communities, ecosystems, and officially designated critical habitats and threatened or endangered species that may be impacted by activities associated with development.

3.1.38**sustainable development**

Successful practices, processes, and technologies that support ongoing development goals and provide for the conservation of ecosystem functions to benefit future generations of society and wildlife.

3.1.39**topsoil**

The upper, outermost layer of soil with the highest concentration of organic matter and microorganisms where most of the biological activity, including plant growth, occurs.

NOTE Typically the top 5 in. to 10 in. (13 cm to 25 cm) of soil.

3.1.40

undesirable plants

Any plants that result in effects that are not consistent with conservation goals.

3.2 Abbreviations

BES	biodiversity and ecosystem services
BLM	Bureau of Land Management
CCA	candidate conservation agreements
CCAA	candidate conservation agreement with assurances
CFR	Code of Federal Regulations
ESA	Endangered Species Act
FWS	Fish and Wildlife Service
GIS	geographic information systems
HCP	habitat conservation plan
ITP	incidental take permit
NEPA	National Environmental Policy Act
SCADA	supervisory control and data acquisition
WAFWA	Western Association of Fish and Wildlife Agencies

4 Project Planning

4.1 General

There are ecological, regulatory, economic, and reputational drivers for operators to apply conservation practices. The conservation measures are often unique to the circumstances of a project and/or location. When feasible, sites that have been previously disturbed or are otherwise of low habitat value should be considered first for development. In this section, common elements of oil and natural gas activities and perspectives relevant to species and habitat conservation are reviewed. The key principle is to consider risk management early in the planning of the project.

4.2 Life Cycle of Development

The typical life cycle of a well can be defined by activities associated with planning, construction, drilling, completion, production, plugging and abandonment (P&A), and reclamation. The average life of a typical well is 20 to 30 years, most of which is spent in the production phase. Construction, drilling, and completion phases account for the major scope of disturbance, yet normally occupy only two to six weeks of the lifetime of the well. Exploration and production projects for oil and natural gas are unique in that they generally disturb habitat and displace wildlife on a temporary (life of the project or operation) rather than on a permanent basis. In the case of drilling and production operations when the mineral resource does not meet production criteria, the well is decommissioned, all the well infrastructure is removed, and the area is reclaimed.

4.3 Regulatory Engagement

Operators should work with regulatory agencies to identify shared conservation goals and objectives that can affect project siting, scheduling, design, routes of access, mitigation measures, and decommissioning and reclamation requirements. Regulatory agencies can either have authority to issue permits or can offer recommendations or requirements to the agencies with such authority. This level of advance planning will afford predictability and efficient execution of the project.