

TARGET SPECIES SCORING JUSTIFICATION CHECKLIST

Step 1 (Credit Scoring) of the [Wildlife Connectivity Advance Mitigation Guidelines](#) (Guidelines) require sponsors to submit a justification to support their [Target Species Scoring Sheet](#) scores as part of a wildlife connectivity action credit proposal. The sponsor shall justify their Target Species Scoring Sheet scores by providing CDFW with the information in this Target Species Scoring Justification Checklist. This checklist contains all the justification items in Section 4: Target Species Ecological Benefit Crediting Considerations of the Guidelines. See the [Wildlife Connectivity Action Bank Checklist](#) or the [Wildlife Connectivity Action MCA Checklist](#) for more information about when the wildlife connectivity action credit proposal is needed within the bank or MCA process.

The sponsor must use the best available science for the scoring justification including, but not limited to, monitoring data collected or obtained by the sponsor, peer-reviewed literature, pre-existing citable publicly available datasets, and reports from government agencies and universities. Where site-specific data are not available, efforts to find data from other parts of the species' range, relevant life history data for the species, or use of data from similar species that can act as species proxies may be utilized. If the sponsor believes a specific crediting consideration element is not applicable to the proposed wildlife connectivity action, the sponsor should provide justification for why it is inapplicable.

This checklist is a part of the Guidelines.

*** The sponsor must submit a separate scoring justification for each target species.**

Checklist

Section 4.1 Ecological Engineered Design

1. The sponsor shall provide a full set of engineered design plans that must include:
 - Existing conditions;
 - Wildlife connectivity structure dimensions and a written description of how these structure dimensions allow for the movement of the target species;
 - Wildlife connectivity action approaches;
 - Engineered drawings in plan, elevation, longitudinal profile and cross-sectional views depicting the 2-, 5-, and 100-year hydraulic events including potential debris flow and how the service life of the design has taken into consideration how each of these events will be increasing due to climate change (if applicable);

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- The sponsor should consider including the 500-year floodplain as an indicator of future climate risk (see Appendix A of the [Guidelines](#)); and
 - Fencing or other directional implements (if applicable).
- 2. The sponsor shall provide a written description of the proposed ecological engineered design that must include:
 - Structure Dimensions;
 - Noise and Light Minimization Measures;
 - Surface Substrates, Vegetation and Hydrogeomorphic Components;
 - Approaches, Fencing or Other Directional Implements; and
 - Designing for Resilience to Climate Change.

4.1.1 Structure Dimensions

- 3. The sponsor shall provide a written description of how the wildlife connectivity structure dimensions could facilitate successful movement for the target species that must include:
 - The wildlife connectivity structure width, length, and height (if applicable);
 - The openness ratio (calculated in meters) for underpasses, and its suitability for the target species. The openness ratio is defined as the structure's (width x vertical clearance) / length;
 - If there are turns in the crossing, justify why; and
 - Whether there is a direct line-of-sight and justification if not.

4.1.2 Noise and Light Minimization Measures

- 4. The sponsor shall provide a written description of how the wildlife connectivity action design minimizes the intensity of noise and light coming from the built infrastructure (e.g., road), traffic, or the wildlife connectivity structure itself. The description must include at minimum:
 - Baseline noise and light conditions; and
 - Designs implemented to account for noise and light minimization measures to encourage use by the target species.

4.1.3 Surface Substrates and Vegetation

- 5. The sponsor shall provide a written description of and plan for the vegetation and surface substrates used in the design. The description must include at minimum:
 - The vegetation used for the plan;
 - Proposed vegetation plantings by type and quantity;

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- How the proposed vegetation will meet the target species' needs, including vegetation within or on top of the structure, as well as both sides of the approach to the wildlife connectivity structure;
 - When vegetation may not be feasible for underpasses or other shaded structures, the description should focus on items B-D below;
- The soil substrates or imported materials used for the design to mimic natural conditions;
 - A rationale if the substrates are not sourced from the project area; and
 - A list of the appropriate escape and resting cover elements (e.g., large woody debris, rocks) for the target species and spacing between the elements.

The written description for aquatic wildlife connectivity actions, as applicable, must include:

- How the design simulates characteristics of the natural stream system, providing ecological continuity based on the upstream and downstream structural complexity (e.g., logs, rocks, pools, riffles, moisture regime);
- A discussion on the flexibility and resilience of the proposed streambed and streambank substrates based on hydraulic and geomorphic principles.
- An analysis of the existing hydrogeomorphology of the wildlife connectivity action's site and the adjacent up- and downstream sections;
- How the wildlife connectivity action is designed to connect the hydraulic and geomorphic processes;
- How the design accounts for how the sheet flow, grade, velocity, water depth, and flow capacity over a range of flow events might affect the movement of the target species at all or most life stages.

The written description for aquatic wildlife connectivity actions, as applicable, should include at minimum:

- Data on floodplains and elevated benches that would allow for terrestrial species crossings during at least a 100-year flood event; and
- How terrestrial species movement needs, in addition to aquatic species, have been incorporated into the design.

4.1.4 Approaches and Fencing or Other Directional Implements

6. The sponsor shall provide a written description of how the approach to the wildlife connectivity structure and fencing or other directional implements was designed to be attractive to target species and facilitate use of the wildlife connectivity action. The description must include at minimum:

- How the approach design mimics the surrounding landscape elevation, slope, topography and ruggedness, substrates, and vegetative composition to facilitate target species movements;

- How incorporating elements to increase the target species' sense of safety, such as providing some sunlight within underpasses, was incorporated into the design based on the target species' needs;
- For aquatic target species, how any potential hydraulic deficiencies caused by existing built infrastructure (based on upstream and downstream conditions) were accounted for in the design (e.g., step pools and constructed riffles);
- A description of the fencing or other directional element (e.g., escape ramp), locations, and design based on the needs of the target species, or an ecological justification if fencing or other directional elements are not proposed;
- A list of any proposed openings or gates to the fencing;
- A description of how the fencing or other direction elements suit the needs for a wider range of species that may also find and use the wildlife connectivity structure;
- How the design directs individuals of the target species including any wrap around or diagonal arms;
- The directional fencing height;
- The fence style, including material, mesh sizing, and whether mesh sizing is consistent with the target species;
- If fencing will be buried or flush to the ground;
- The length and location of the fencing array and any resting cover incorporated in the design;
- The escape ramps or jumpouts design and placement based on the species in the area and location specifications (if applicable); and
- If and where any cattle guards are included in the design.

3.1.5 Designing for Resilience to Climate Change

7. The sponsor shall provide CDFW with a written description of how the wildlife connectivity action has been designed to account for future climate conditions. The description must include at minimum:
 - How the wildlife connectivity action has been designed for longevity considering the potential for flooding and wildfire; and
 - How the vegetation in the design is climate resilient.

Section 4.2 Value of the Habitat Connected

4.2.1 Maps

8. The sponsor shall include maps containing the information listed below.
 - Coordinates (latitude/longitude in decimal degrees) of the proposed wildlife connectivity action;

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- Boundary of the wildlife connectivity action (See wildlife connectivity action definition in Section 1.4 of the [Guidelines](#));
- Locations of the surrounding lands connected by the wildlife connectivity action;
- Labels identifying existing and proposed protection mechanism(s) for the surrounding lands connected by the wildlife connectivity action. The existing protection mechanism(s) labeled on the map shall be the current protection mechanism(s) at the time of the sponsor's map submission. Examples of protection mechanisms include, but are not limited, to conservation easements; federal, state, local public agency, non-profit, or special district owned lands protected for fish, wildlife, or habitat; deed restrictions that restrict development or construction; open space; parks; and if parcels are associated with easements (See [RCIS Guidelines](#) – Section 4.3.4.3 for resources on protected areas);
- Label private lands in the surrounding lands;
- Labels identifying existing and proposed city or county zoning of the surrounding lands. Existing zoning shall identify the zoning designation at the time of the sponsor's map submission. Examples of city and county zoning include but are not limited to industrial, open space, parks; green space, recreational, commercial, agricultural, single-family residential, multiunit residential, and schools;
- Locations of all aquatic resource features (e.g., ephemeral creeks, ponds, swales, wetlands, etc.) within the target species dispersal range connected by the wildlife connectivity action. If the proposed wildlife connectivity action is connecting aquatic resources or removing aquatic barriers, maps showing the benefit of the action to the whole watershed would be appropriate;
- Target species' habitat in the surrounding lands. Use publicly available resources and/or aerial imagery;
- Location of known built infrastructure, natural or man-made hazards, and barriers to target species dispersal to habitat in the surrounding lands;
- A map showing the [California Natural Diversity Database \(CNDDDB\)](#) records (or other appropriate dataset of species distribution or occurrence) in the surrounding lands; and
- A habitat suitability map, if available, such as the California Habitat Relationships ([CWHR](#)) Predicted Habitat Models or other scientific source.

4.2.2 Tables

9. The sponsor shall include table(s) containing the information listed below.

- Land ownership (if privately owned, indicate "private") in the surrounding lands connected by the wildlife connectivity action;
- Total habitat acreage and, if applicable, total acreage of aquatic resources by type (e.g., pond, wetland, watercourse, etc.) and linear feet

of stream in the surrounding lands connected by the wildlife connectivity action. Acreages shall be separated by existing and proposed protection mechanisms and city and county zoning; and

- Existing habitat types in the surrounding lands wildlife connectivity action. Existing habitat types shall identify the habitat types present at the time of the sponsor's table submission. When identifying habitat types, the sponsor should consider using scientific literature, aerial or satellite imagery, LiDAR (Light Detection and Ranging), [Vegetation Classification and Mapping Program](#) vegetation maps, or other resources to determine which habitat types occur beyond the bank or MCA if physical access to the sites are infeasible.

4.2.3 Written Description

10. The sponsor shall provide a written description that must include:

- Known quality of habitat in the surrounding lands connected by the wildlife connectivity action. The description must include at minimum, as applicable:
 - General condition of the vegetation and habitat features (streams, ponds, woody cover, etc.) including a list of native species, vegetation type, size, landscape structure, and vegetation density;
 - Ability of the habitat to support target species. Include known or existing supporting documentation, surveys, and/or scientific studies;
 - Extent of known degradation of vegetation and habitat features (e.g., construction, built infrastructure, human usage, roads, trails, presence of invasive species, etc.) within the surrounding lands that are connected by the wildlife connectivity action, if applicable;
- Known future construction projects, including county/state regional transportation plans and country general plans, that may impact the area (If the project is an MCA, sponsors can consult the RCIS for this information.);
- Known future restoration projects that would benefit the target species' habitat;
- Known hydroperiod and water quality (see BIOS datasets 232-234 for U.S. EPA's impaired waters) of aquatic resource features;
- Vulnerability of habitat to climate change including whether the habitat type is projected to experience changes in inundation, fire regimes, temperature, hydroperiod, water quality, or vegetation quality;
- Whether the habitat in the surrounding lands is currently utilized by the target species. The description must include at minimum:
 - All presence information for the target species, such as scientific literature, research, biological surveys, [CNDDDB](#), etc., that identifies use of the habitat.

Section 4.3 Value of the Particular Location

4.3.1 Topography, Aquatic Resource, of Other Natural Pathway

11. The sponsor shall provide a written description that must include:

- The wildlife connectivity action site's current slope gradient, topographic barriers to wildlife;
- A description of the target species' likelihood to navigate through the wildlife connectivity structure based on the topography-related cues that the target species is likely to rely on, including but not limited to line-of-sight, noise, light, etc. (also see Section 4.5: Population-Level Benefits to Target Species and Section 4.1: Ecological Engineered Design of the [Guidelines](#));
- A description of any proposed topography changes with an explanation of the ecological need for the changes. The description should reference the construction plan;
- The aquatic resource or other natural pathways currently present at the wildlife connectivity action's site and how they meet the needs of the target species; and
- Any impacts of aquatic resources or other natural pathways to species movements, and a strategy to address impacts (see Section 4.1: Ecological Engineered Design of the [Guidelines](#)).

4.3.2 Existing Vegetation and Other Cover

12. The sponsor shall provide CDFW with a written description of the target species' need, or lack of need, for cover and how the vegetation cover in this particular location was considered based on the species or habitat. The description must include at minimum:

- The existing wildlife connectivity action site's vegetation (or other) cover conditions and how it currently meets the target species' needs.

4.3.3 Movement and Mortality Data

13. The sponsor shall provide CDFW a written description of how best available wildlife movement (e.g., wildlife satellite collar data, camera trap data, etc.) and mortality information (e.g., wildlife satellite collar data, roadkill surveys, etc.) for the target species was used to develop the wildlife connectivity action. The description must include at minimum:

- Key target species findings from:
 - Mortality data;
 - Species-specific movement studies including non-fatal successful crossing data, as available; and
 - Information about historical use (e.g., historical fish use of a stream reach that is currently blocked at the proposed wildlife connectivity action's site).

The sponsor should consult the [California Roadkill Observation System](#) and [California Department of Transportation's \(Caltrans'\) Large Mammal-vehicle Collision Hot Spot Analyses for terrestrial species mortality data](#). However, these data sets are opportunistic and not comprehensive across the state for species or spatial coverage.

4.3.4 Existing Conditions

14. The sponsor shall provide CDFW with a written description of the existing conditions at the particular location. The description must include at minimum:

- The extent of the barrier, such as the width or volume.
 - Traffic volume for the state highway system can be accessed through the [Caltrans Traffic Census Program](#) and [spatial geographic information system \(GIS\) data](#) are also provided, if applicable;
- Current and ambient light or noise levels and any potential light or noise barriers;
- A summary of any other existing or planned wildlife connectivity actions nearby, including what species are known to, or are expected to, use them;
- An explanation of the ecological value of adding the proposed wildlife connectivity action at the proposed location; and
- How current obstacles to wildlife movement are addressed by the wildlife connectivity action's proposed design, including consideration of complete structure replacement versus retrofitting the existing structure to provide passage through existing built infrastructure.

The design drawings and/or figures must include at minimum:

- All existing built infrastructure associated with the proposed wildlife connectivity action and how it is incorporated into the design;
- Existing landscape conditions and associated movement pathways, and the incorporation of them into the design planning (see Section 4.3: Value of the Particular Location of the [Guidelines](#)); and
- Utilities, aquatic resources, shoulder widths, median barriers, fencing, side slopes, and local landscape features (e.g., forest, cliff, riparian) and how they may impact new design features.

4.4.5 Human Impacts

15. The sponsor shall provide CDFW with a written description of the human impacts in the particular location. The description must include at minimum:

- A list of all human impacts in the area that could impact the success of the wildlife connectivity action, such as distance to urban edge, human population density, recreation, trails, trespass in the area, etc.;
- For working lands (e.g., rangeland, agriculture), provide an assessment of potential negative impacts, if any, to the target species;

- How the wildlife connectivity action design includes elements that prevent unauthorized human use or trespass while allowing wildlife usage; and
- Any measures that will be used to ensure that the wildlife connectivity action remains for the use of wildlife only.

Section 4.4 Critical Linkages

4.4.1 Regional Connectivity

16. The sponsor shall provide CDFW with a written description of the regional connectivity for the proposed wildlife connectivity action. The description must include at minimum, if available:
- The ACE terrestrial connectivity ranking for the proposed wildlife connectivity action's site;
 - Any regional linkage systems (using the BIOS Habitat Connectivity Viewer) that the proposed wildlife connectivity action's site is within;
 - Determine if the proposed wildlife connectivity action's site is within federally designated critical habitat for the target species and for non-target species; and
 - List of regional conservation plans that reference the proposed wildlife connectivity action's site.

4.4.2 Local Connectivity

17. The sponsor shall provide CDFW with a written description of the fish and wildlife barriers that the proposed wildlife connectivity action would address. The description must include at minimum:
- Whether the proposed wildlife connectivity action's site is listed in the latest California Wildlife Barriers Report, Restoring California's Wildlife Connectivity Report, or the wildlife movement barriers dataset;
 - Whether the proposed wildlife connectivity action's site is listed in PAD;
 - Whether any other reports or resources list the proposed wildlife connectivity action's site as a wildlife barrier; and
 - Information identifying the target species' geographic ranges and how they are affected by the barriers in the area.
 - The sponsor shall provide CDFW with a written description of the migration and dispersal routes the proposed wildlife connectivity action would address. The description must include at minimum:
 - Any migration and dispersal routes that overlap with the proposed wildlife connectivity action's site including those in the CDFW Ungulate Migration Viewer.

Section 4.5 Population Level Benefits to Target Species

4.5.1 Genetic Diversity and Breeding Opportunities

18. The sponsor shall provide CDFW with a written description of how the wildlife connectivity action would improve or create genetic and breeding opportunities for the target species. As applicable, the description must include at minimum:

- A narrative about the current genetic health, demographic, and population health status;
- How the wildlife connectivity action would benefit the species' demographic and population health in general; and
- How the wildlife connectivity action could specifically improve the following:
 - Dispersal and movement opportunities for the target species (e.g., increased access to spawning or breeding habitats);
 - Colonization/recolonization of unoccupied habitat;
 - Population fragmentation issues, including demographic rescue of local populations headed for localized extinction, and an understanding of the risk of potential ecological sinks; and
 - Access to food, mates, and/or available habitat/breeding areas.

4.5.2 Species Adaptation to Climate Change

19. The sponsor shall provide CDFW with a written description of how the wildlife connectivity action may improve target species' adaptation to climate change. As applicable, the description must include at minimum:

- A discussion on how the wildlife connectivity action could improve access to additional latitudes and elevation of potentially suitable habitat;
- A description of the climate impacts on connectivity at the site, including rising temperatures, floods, drought, wildfires, and mud slides, as well as the effects of climate change impacts such as altered water quality and habitat fragmentation;
- A description of the target species' climate vulnerabilities at the site based on the climate impacts listed in B above; and
- A list of strategies used in the wildlife connectivity action to support the target species' adaptation to climate change.

Section 3.2.2.1 Unique Project Characteristics

20. The sponsor can provide a description of any unique project characteristics for the proposed wildlife connectivity action that are not captured in the other crediting considerations listed above for the target species.

Section 3.2.3 Credit Factor (only during pilot period)

21. The sponsor shall propose a crediting factor and credit amounts for the target species with a clear written justification as to why the crediting factor was chosen. The justification should be based on the best available information.