MARBLED MURRELET STATUS REVIEW UPDATE

Consultation

Comments and Information Received as of April 7, 2017

Part 1

Please note that attachments consisting of journal articles and lengthy reports were replaced with web links when these materials were available online.
Hello Christina,

Regarding your request below, the Department of Ecology does not have the information you are requesting. You may be able to obtain this information from the Washington Department of Fish & Wildlife. You can submit a public disclosure request to the Washington Department of Fish & Wildlife at this link: [http://wdfw.wa.gov/about/public_disclosure/](http://wdfw.wa.gov/about/public_disclosure/).

Thank you.

Linda Helmick
Public Disclosure Compliance Specialist
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504
Telephone: 360-407-6446
The Oregon Department of Fish and Wildlife (ODFW) has initiated a review of the biological status of the Marbled Murrelet (*Brachyramphus marmoratus*) in Oregon. This status review is in response to a petition from Cascadia Wildlands and five other conservation groups. The petition requests that the Marbled Murrelet be reclassified from threatened to endangered (uplisted) under the Oregon Endangered Species Act.

In an effort to consult with agencies, organizations, local governments, tribes, other states, and interested persons, we are writing to notify you of this status review and to request any relevant scientific information that you may have to inform our review. We are particularly interested in information on Marbled Murrelet biology, population trends and demographics, marine and terrestrial habitat conditions, threats, and the adequacy of state or federal programs or regulations. ODFW will use documented and verifiable scientific information or other best available data in the status review. Please refer to the attached consultation letter and handout for details. More information is also available through our website at http://www.dfw.state.or.us/wildlife/hot_topics/marbled_murrelet.asp.

Please submit information or data by April 7, 2017 to odfw.marbledmurrelet@state.or.us or to ODFW, Marbled Murrelet, 4034 Fairview Industrial Drive SE, Salem, OR 97302.

Thank you,

Christina Donehower  
Strategy Species Coordinator  
Oregon Department of Fish and Wildlife  
4034 Fairview Industrial Drive SE  
Salem, OR 97302  
(503) 947-6099

If you believe that you have received this message in error, please notify us so that we can direct this information to the appropriate person.
February 16, 2017

Dear Interested Party:

Subject: Notification of Marbled Murrelet Status Review and Consultation Pursuant to ORS 496.176(4) and OAR 635-100-0105(10)

The Oregon Department of Fish and Wildlife (Department) is evaluating the status of the Marbled Murrelet (Brachyramphus marmoratus) in Oregon. This status review is in response to a petition received by the Oregon Fish and Wildlife Commission (Commission) on June 21, 2016 from Cascadia Wildlands, the Center for Biological Diversity, Coast Range Forest Watch, Oregon Wild, the Audubon Society of Portland, and the Oregon Chapter of the Sierra Club. The petition requests that the Marbled Murrelet be reclassified from threatened to endangered (uplisted) under the Oregon Endangered Species Act.

The Marbled Murrelet is a small seabird that breeds along the Pacific Coast from Alaska to central California. It spends most of its life in marine waters but flies inland to nest in old growth and late-successional forests. The Marbled Murrelet was listed as threatened under the federal Endangered Species Act in 1992 and threatened under the Oregon Endangered Species Act in 1995. The species is currently listed as state-endangered in both Washington and California.

At its meeting on September 2, 2016, the Commission determined that the petition contained substantial scientific information to initiate a Marbled Murrelet status review for Oregon. The Commission is required to make a final determination on whether reclassification is warranted under OAR 635-100-0111(1) within one year from the date of receipt of the petition (i.e., by June 21, 2017); the Commission may extend this deadline for up to 12 additional months if the Commission determines the information available is limited or other appropriate circumstances require the extension (OAR 635-100-0110(8)).

In making a reclassification determination, the Commission is required to consult with affected state and federal agencies, affected cities and counties, affected federally recognized Indian tribes, the Natural Heritage Advisory Council, other states having a common interest in the species, and interested persons who have asked to be consulted and whose names are included on the Commission’s mailing list for such purposes (ORS 496.176(4); OAR 635-100-0105(10)). Input by these groups and individuals is critical to the review process.
So that the Commission can consider all appropriate scientific and other data available on the species to reach a justified decision and comply with the requirements of ORS 496.176(4) and OAR 635-100-0105(10), the Department requests that you provide any documented and verifiable scientific information or other data that would assist in evaluating the criteria for reclassification of a species from threatened to endangered laid out in OAR 635-100-0111(1) and 635-100-0105(6). For reference, the reclassification criteria are (1) a determination that the likelihood of survival of the species has diminished such that the species is in danger of extinction throughout any significant portion of its range within Oregon; and (2) a determination that one or more of the following three factors exist: (a) that most populations of the species are undergoing imminent or active deterioration of their range or primary habitat; (b) that overutilization of the species or its habitat for commercial, recreational, scientific, or educational purposes is occurring or is likely to occur; or (c) that existing state or federal programs or regulations are inadequate to protect the species and its habitat.

Pursuant to 635-100-0100(16), information that would be considered “verifiable” includes, but is not limited to: (a) articles and information published in peer-reviewed scientific journals, such as the Journal of Wildlife Management and Transactions of the American Fisheries Society; (b) information developed by the Department, which has been peer reviewed by outside experts (e.g., agency management plans, Nongame Wildlife Program Technical Reports); (c) information developed by federal agencies, which has been peer reviewed (e.g., peer-reviewed agency management plans, final environmental impact statements, adopted recovery plans, interagency technical reports); (d) peer-reviewed data gathered by the Department or others using standard methodologies or protocols; and (e) information developed by the Pacific Northwest Electric Power and Conservation Planning Council or other organizations, which has been peer reviewed.

The Department’s staff have already reviewed many documents regarding the Marbled Murrelet such as those listed in the petition. The petition is available from the Commission website at [http://www.dfw.state.or.us/agency/commission/minutes/16/09_sept/Exhibit%20F_Attachment%202_Petition.pdf](http://www.dfw.state.or.us/agency/commission/minutes/16/09_sept/Exhibit%20F_Attachment%202_Petition.pdf). If you believe that you have data or other information that would augment this information, please provide it to the Department by April 7, 2017. This will enable us to evaluate the information prior to a briefing before the Commission on June 9, 2017 and to include it in our status review. Once staff have completed the status review, we will provide a draft for public comment and peer review.

Please send information to: ODFW, Marbled Murrelet, 4034 Fairview Industrial Drive SE, Salem, OR 97302. Information may also be submitted by email to odfw.marbledmurrelet@state.or.us. If you have any questions regarding this matter, please contact Christina Donehower (503-947-6099). Note that information submitted, including names and addresses, may become part of the public record.
We would like to thank you for any assistance you might provide the Department in this important process. A handout with additional background on the Marbled Murrelet and Oregon Endangered Species Act is enclosed. Periodic updates and other resources will also be posted to our Marbled Murrelet webpage at http://www.dfw.state.or.us/wildlife/hot_topics/marbled_murrelet.asp.

Sincerely,

Kevin Blakely
Wildlife Division Deputy Administrator

Enclosure
The Issue

A petition to reclassify the Marbled Murrelet was filed in June 2016. Cascadia Wildlands and five other co-petitioners assert that the Marbled Murrelet has declined to such a point that endangered status is warranted under the Oregon Endangered Species Act (OESA). The Oregon Fish and Wildlife Commission must decide whether to reclassify (uplist) the Marbled Murrelet from threatened to endangered under the OESA. The OESA requires action within one year of a petition being filed if it is accepted by the Commission; however, the Commission may extend this deadline for up to 12 additional months if the Commission determines that the information available is limited or other appropriate circumstances require the extension.

Commissioners will be asked to decide whether circumstances meet legal requirements to justify reclassification of the Marbled Murrelet as endangered. Oregon Department of Fish and Wildlife biologists and administrators will consult with affected public agencies, federally-recognized Indian tribes, and interested individuals and organizations prior to the final hearing. This briefing paper is part of that consultation effort.

The following information provides background on Marbled Murrelet life history, its legal status in Oregon and elsewhere in its range, and details about the OESA.

Marbled Murrelet Description and Current Legal Status

The Marbled Murrelet (Brachyramphus marmoratus) is a small seabird that breeds along the Pacific Coast from Alaska to central California. Marbled Murrelets spend most of their lives in marine waters and forage at sea on small fish and invertebrates. However, they are unique in that they fly inland (sometimes considerable distances) for nesting and depend upon old growth and coastal late-successional forests for nest sites.

Marbled Murrelets are federally listed as threatened under the U.S. Endangered Species Act in Washington, Oregon, and California, and state-listed as threatened in Oregon and endangered in Washington and California. In British Columbia, Marbled Murrelets are listed as threatened under the Canadian Species at Risk Act.

Loss and degradation of late-successional forest nesting habitat were primary factors contributing to federal and state listings. Mortality from oil spills and net fisheries, nest predation, disease, reduced prey availability and quality, marine pollution, disturbance, and climate effects on marine and terrestrial habitat are among other potential threats to the species across its range.
Applying Oregon ESA Reclassification Criteria

The OESA sets out specific criteria and procedural requirements which must be met to reclassify a species. In order to reclassify a native species as endangered, the Oregon Fish and Wildlife Commission is required to determine, based on documented and verifiable information, that the likelihood of survival of the species has diminished such that the species is in danger of extinction throughout any significant portion of its range within Oregon. In addition, the Commission is required to determine that one or more of the following factors exist:

(a) that most populations of the species are undergoing imminent or active deterioration of their range or primary habitat;
(b) that overutilization of the species or its habitat for commercial, recreational, scientific, or educational purposes is occurring or is likely to occur; or
(c) that existing state or federal programs or regulations are inadequate to protect the species or its habitat.

Staff will prepare a biological status review for the Marbled Murrelet in Oregon that specifically addresses these reclassification criteria.

Oregon ESA Effects

The most direct effect of listing a species as threatened or endangered under the OESA is on state-owned or leased lands. Private lands are not directly affected by the OESA except through the Oregon Forest Practices Act, which requires special protection for both federal and state-listed species. The state law is only advisory for federal land managers.

State agencies work together to implement conservation programs adopted by the Oregon Fish and Wildlife Commission, and Oregon Department of Fish and Wildlife biologists act as scientific consultants to other land and water managers to advise whether a management action can affect survival or recovery of a listed species.

The OESA requires particular state agencies to develop plans for the management and protection of endangered species, and to comply with ‘survival guidelines’ adopted by the Oregon Fish and Wildlife Commission for threatened species. Survival guidelines are quantifiable and measurable guidelines necessary to ensure the survival of individual members of the species. They may include take avoidance and protecting resource sites such as nest sites or other sites critical to the survival of individual members of the species. Under the OESA, “take” is defined as “to kill or obtain possession or control of any wildlife”.

Implications of Uplisting

If the Marbled Murrelet were to be uplisted, the Oregon Fish and Wildlife Commission would be required to establish survival guidelines for the species at the time of reclassification and to work with state land owning and managing agencies to determine if state land can play a role in the conservation of the species (note that survival guidelines are not already in place for the murrelet since it was first listed in May 1995, and the survival guidelines requirement was not approved until July 1995). Survival guidelines would serve as interim protection until endangered species management plans were developed by applicable state agencies and approved by the Commission.

Additional Information

Oregon Administrative Rules (OARs) for Oregon fish and wildlife: http://dfw.state.or.us/OARs/oars.asp#Wildlife. See the Division 100 (Wildlife Diversity Plan) section for OARs pertaining to listed species/reclassification.

Oregon Fish and Wildlife Commission meetings: http://www.dfw.state.or.us/agency/commission/.

Questions? Contact the Oregon Department of Fish and Wildlife at odfw.marbledmurrelet@state.or.us or 503-947-6301.

Photo Credit: David Patte, USFWS
Marbled Murreletes appear to be in the cyclical portion downward (downward/upward) trend because of the lack of a plentiful food sources (see pacific-herring), competition from double crested cormorants (see cormorant article) and cyclical ocean warming (warming/cooling) trend. All of the above appear to be the normal cyclical cycle of animals dependent on the ocean for sustainability. I do not believe that placing the murreletes on the endangered list will help. Only an improvement in ocean conditions will enable the murreletes to recover. Also, 90+ percent of the murreletes inhabit British Columbia and Southeast Alaska.

Bob Main
Coquille, Oregon

http://www.fisheries.noaa.gov/pr/species/fish/pacific-herring.html

Double-crested cormorant

From Wikipedia, the free encyclopedia
Jump to: navigation, search

The double-crested cormorant (*Phalacrocorax auritus*) is a member of the cormorant family of seabirds. It occurs along inland waterways as well as in coastal areas, and is widely
distributed across North America, from the Aleutian Islands in Alaska down to Florida and Mexico. Measuring 70–90 cm (28–35 in) in length, it is an all-black bird which gains a small double crest of black and white feathers in breeding season. It has a bare patch of orange-yellow facial skin. Five subspecies are recognized.

The double-crested cormorant is found near rivers and lakes and along the coastline. It mainly eats fish and hunts by swimming and diving. Its feathers, like those of all cormorants, are not waterproof and it must spend time drying them out after spending time in the water. Once threatened by the use of DDT, the numbers of this bird have increased markedly in recent years.

Marbled murrelet

The marbled murrelet (Brachyramphus marmoratus) is a small seabird from the North Pacific. It is a member of the auk family. It nests in old-growth forests or on the ground at higher latitudes where trees cannot grow. Its habit of nesting in trees was suspected but not documented until a tree-climber found a chick in 1974, making it one of the last North American bird species to have its nest described. The marbled murrelet has declined in number since humans began logging its nest trees in the latter half of the 19th century. The decline of the marbled murrelet and its association with old-growth forests, at least in the southern part of its range, have made it a flagship species in the forest preservation movement. In Canada (north of 50° North Latitude) and Alaska, the declines are not so obvious because populations are much larger and the survey techniques have not had sufficient power to detect changes.

Description[edit]

The marbled murrelet is a small (25 cm), chunky auk with a slender black bill. It has pointed wings and plumage that varies by season. The non-breeding plumage is typically white underneath with a black crown, nape, wings and back. The bird closely resembles its closest relative, the long-butted murrelet; in fact, these species were considered conspecific up until 1998. In breeding plumage, both have a brown mottled body and face. The long-butted has a pale white throat, lacking in the Marbled. In winter plumage, the marbled murrelet has a white neck collar, absent in long-billed. The marbled murrelet is shorter butted and slightly smaller than the long butted murrelet.

\Diet and feeding[edit]
The marbled murrelet feeds at sea both in pelagic offshore areas (often associating with upwellings) and inshore in protected bays and fiords. It feeds principally on sandeels, also taking herring, capelin and shiner perch. The bird has not been known to wander from the Pacific coast of North America, all inland and eastern Brachyramphus records being of the closely related long-billed murrelet.

Marbled murrelets feed below the water surface on small fish and invertebrates. Some principal foods include sand lance (Ammodytes hexapterus), Pacific herring (Clupea haringus), capelin (Mallotus villosus), and the invertebrates Euphausia pacifica and Thysanoessa spinifera.

Marbled murrelets often forage in pairs but do not feed in large flocks as do other alcids. Loose aggregations of 500 or more birds occasionally occur in winter. DNA tests have shown that the foraging duos are not necessarily breeding pairs. Subadults feed singly; but in early July, when pairs of adults are still feeding young, mixed flocks begin to form. Marbled murrelets feed during the day and at night.

Breeding

The nesting behavior of the marbled murrelet is unusual, since unlike most alcids it does not nest in colonies on cliffs or in burrows, but on branches of old-growth and mature conifers such as western hemlock, Sitka spruce, Douglas fir and coastal redwood, as far as 80 km inland. It lays one egg on a platform of lichen or moss on these branches (less often on the ground). In northern populations, murrelets nest on the ground among rocks, as do other related murrelet species. The egg is incubated for a month, then fed for around 40 days until the chick is able to fledge. Adults fly from ocean feeding areas to inland nest sites, mostly at dusk and dawn. They feed nestlings at least once and sometimes twice per day or night. Usually only one fish is carried to the young. The chick then leaves the nest and flies unaccompanied to the sea. Breeding success is low and chick mortality high.

Marbled murrelets do not breed until they are at least 2 years old. Marbled murrelets nest from mid-April to late September. Peak activity occurs from mid-June to late July in California, and the second week of July to mid-August in Oregon. Marbled murrelet are semicolonial in nesting habits. Two nests found in Washington were located only 150 feet (46 m) apart. Not all mature adults nest every year. Marbled murrelets lay only one egg.

Nestlings fledge in 28 days. Young marbled murrelets remain in the nest longer than other
alcids and molt into their juvenile plumage before leaving the nest.[2] Fledglings fly directly from the nest to the ocean.[5]

Habitat and distribution[edit]

Marbled murrelets occur in summer from Alaska's Kenai Peninsula, Barren islands, and Aleutian Islands south along the coast of North America to Point Sal, Santa Barbara County, in south-central California. Marbled murrelets winter mostly within the same general area, except that they tend to vacate the most northern sections of their range, especially where ice forms on the surface of the fiords. They have been recorded as far south as Imperial Beach of San Diego County, California.[2]

Habitat[edit]

Marbled murrelets are coastal birds that occur mainly near saltwater within 1.2 miles (2 km) of shore.[2] However, marbled murrelets have been found up to 59 miles (95 km) inland in Washington, 35 miles (56 km) inland in Oregon, 22 miles (37 km) inland in northern California, and 11 miles (18 km) inland in central California. Over 90% of all marbled murrelet observations in the northern Washington Cascades were within 37 miles (60 km) of the coast. In Oregon, marbled murrelets are observed most often within 12 miles (20 km) of the ocean.[5] Many marbled murrelets regularly visit coastal lakes. Most lakes used by marbled murrelets are within 12 miles (20 km) of the ocean, but a few birds have been found at lakes as far inland as 47 miles (75 km). All lakes used by marbled murrelets occur within potential nesting habitat.[6]

Nesting habitat[edit]

From southeast Alaska southward, marbled murrelets use mature or old-growth forest stands near the coastline for nesting.[2][5] These forests are generally characterized by large trees (>32 inches [80 cm] diameter at breast height (d.b.h.)), a multistoried canopy, moderate to high canopy closure or an open crown canopy,[3][7] large snags, and numerous downed snags in all stages of decay.[5] Marbled murrelets tend to nest in the oldest trees in the stand.[5] In Oregon, forests begin to exhibit old-growth characteristics at about 175 to 250 years of age. Moss, on which marbled murrelets nest, forms on the limbs of Douglas-fir that are more than 150 years old.[2]

The only four marbled murrelet tree nests found before 1990 shared the following characteristics: (1) located in a large tree (>47 inches [120 cm] d.b.h.) with an open crown structure, (2) on a moss-covered limb that is camouflaged, partially shaded, and approximately horizontal with a diameter (including associated moss) of at least 14 inches (36 cm), and (3) located within the middle or lower part of a live crown.[7] However, Marshall[8] stated that because of their low aerial buoyancy marbled murrelets often nest high in the treetops or on steep slopes. Habitat must be sufficiently open to allow for easy flight.[3] All marbled murrelet nests found in Washington, Oregon, and California were located in old-growth trees that ranged from 38 inches (88 cm) d.b.h. to 210 inches (533 cm) d.b.h. with a mean of 80 inches (203 cm) d.b.h. Nests were located high above the ground and

[5]
had good overhead protection but allowed easy access to the exterior forest. It was initially believed that marbled murrelets might use the same nest in successive years but there has been little evidence of this.[8]

Stand size is also important in nest sites. Marbled murrelets more commonly occupy stands greater than 500 acres (202 ha) than stands less than 100 acres (40 ha). However, marbled murrelets may nest in remnant old-growth trees or groves that are surrounded by younger trees.[1] In California, marbled murrelets are usually absent from stands less than 60 acres (24 ha) in size. In Washington, marbled murrelets are found more often when old-growth and mature forests make up over 30% of the landscape. Fewer marbled murrelets are found when clearcut and meadow areas make up more than 25% of the landscape. Concentrations of marbled murrelets offshore are almost always adjacent to old-growth or mature forests onshore,[2][5] although marbled murrelets may not use the interior of dense stands.[8]

Where large trees are absent in the northern parts of marbled murrelet range, marbled murrelets nest in depressions on the ground, in rock cavities on the ground, or on rock outcrops.[7] Marbled murrelets are both ground nesters and tree nesters where forests and treeless areas meet.[2]

**Plant communities** [edit]

In northern regions where coniferous forests nest sites are unavailable, marbled murrelets occupy alpine or tundra near the ocean.[2] In Washington and Oregon, marbled murrelets commonly nest in Douglas-fir (*Pseudotsuga menziesii*) dominated stands. They also select stands dominated by mountain hemlock (*Tsuga mertensiana*), western redcedar (*Thuja plicata*), and Sitka spruce (*Picea sitchensis*) for nesting.[2][5] In California, nests are most often located in redwood (*Sequoia sempervirens*) dominated stands with scattered Sitka spruce, western hemlock (*Tsuga heterophylla*) and Douglas-fir. Marbled murrelets also occur in stands dominated by Port-Orford-cedar (*Chamaecyparis lawsoniana*).[9]

**Foraging habitat** [edit]

Marbled murrelets forage in the ocean near shore and in inland saltwater areas such as bays, sounds, and saltwater passageways. Some also forage on inland freshwater lakes. Flocks of 50 or more birds have been observed near freshwater lakes.[6] Subadults occur at sea throughout the summer. Marbled murrelets feed within 1,640 feet (500 m) of shore.[10]

**Winter habitat** [edit]

Marbled murrelet winter habitat is the same as the nesting and foraging habitat. During the winter marbled murrelets use inland old-growth or mature sites for roosting, courtship, and investigating nest sites. The use of inland lakes during the nonbreeding season occurs in conjunction with visits to nesting areas.[6]

**Predators** [edit]

*Steller's jays* (*Cyanocitta stelleri*) and common ravens (*Corvus corax*) prey on marbled
murrelet eggs and nestlings.[7]

Marbled murrelets and humans[edit]

The marbled murrelet is considered globally endangered,[1] with some evidence of decline across its range over the last few decades. The biggest threat to the marbled murrelet was long considered to be loss of nesting habitat (old-growth and mature forests) to logging. Additional factors including high predation rates due to human disturbances and climate-driven changes in ocean conditions are also considered important now.

Scientists at Redwood National Park have established a connection between human presence in marbled murrelet territory and corvid predation of marbled murrelet chicks[citation needed]. Corvid populations, such as Steller's jays, crows, and ravens, are expanding into old-growth forests. Lured by food scraps left by campers and hikers[citation needed], with increased access aggravated by the patchwork forests created by industrial logging[citation needed], corvids more frequently discover marbled murrelet nests in areas where these predator species were not previously found.

The marbled murrelet populations in Washington, Oregon and California were listed as threatened in 1992 by the U.S. Fish and Wildlife Service due to concerns about loss of nesting habitat, entanglement in fishing gear and oil spills. The Canadian population was declared "nationally threatened" in 1990. The status of Alaskan populations are currently under review. The species became a flagship species in efforts to prevent the logging of old-growth forests along the Pacific coast from California to Alaska.

References[edit]

This article incorporates public domain material from the United States Department of Agriculture document "Brachyramphus marmoratus".


Attached please find a letter and annotated bibliography on PNW Research Station research on marbled murrelet in response to your Notification of Marbled Murrelet Status Review and Consultation.

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Mr Kevin Blakely  
Wildlife Division Deputy Administrator  
Oregon Department of Fish and Wildlife  
4034 Fairview Industrial Drive SE  
Salem, OR 97302

Dear Mr Blakely;

The Pacific Northwest Research Station (PNW RS) of the U.S. Forest Service has a long history of research on the marbled murrelet (Brachyramphus marmoratus). In response to your request for documented and verifiable scientific information on the marbled murrelet in Oregon (ref. your letter dated February 16, 2017), we respectfully submit the attached annotated bibliography of select peer-reviewed publications on marbled murrelet produced by the PNW RS since 2002. We hope that this information will be useful to the Oregon Department of Fish and Wildlife as you conduct the Status Review and Consultation for the marbled murrelet. If you have any questions, please feel free to contact Borys Tkacz, Assistant Director for Research, PNW RS (tel. no. 503-808-2115; email: btkacz@fs.fed.us).

Sincerely,

PAUL ANDERSON  
Acting Station Director

Enclosure

   - Summary of methods
     o Reviews research studies that indicate corvids are major nest predators of murrelets, and have increased in abundance in the west due to urbanization and agriculture.
     o Placed artificial nests to simulate murrelet nests at 923 sites for 5 years, and in areas with different amounts forest fragmentation, forest structure, and proximity to human activity.
   - Summary of results
     o Most (80%) nests were visited by potential nest predators within 30 days, regardless of habitat type. There were no consistent effects of forest fragmentation on nest visitation rates by potential predators, or the proportion of artificial nests that were visited.
     o However, nests located close to forest edges consistently showed higher rates of nest predation than those far from forest edges, especially near human habitations and campgrounds. Within unfragmented stands, predation rates increased as predator abundance increased. In areas near human activity, predation rates were similar between fragmented and unfragmented stands.
   - Management implications
     o Structurally simple forest stands had lower abundances of corvids. Managers could consider maintaining even-aged stands near human habitations and recreational areas to reduce corvid populations overall.
     o Increasing the isolation of suitable forest patches is likely to lead to fewer nesting attempts by murrelets and higher predation rates, and smaller patch size will likely lead to increases in the rates of nest predation (reviewed in Table 1, p. 232).

   - Summary of methods
     o Used radar to count marbled murrelets traveling to inland sites on ten river drainages of the Olympia Peninsula, Washington, 1998-2000. Assessed habitat characteristics associated with highest numbers of murrelets.
   - Summary of results
     o Maximum counts of murrelets were strongly correlated with the amount of late seral forest (nesting habitat) in a drainage, and negatively correlated with the edge density of late seral forest. This indicates changes in the amount of late seral forest should affect the numbers of murrelets using individual drainages. These results suggest conservation of nesting habitat may be an effective management strategy to recover marbled murrelet populations.

• Summary of methods
  • Used radar to count murrelets traveling to inland sites on 3-7 drainages on the Olympic Peninsula, Washington, 1996-2002 and 2004. The overall goal was to assess trends in murrelet use of inland sites, and assess whether counts were associated with at-sea counts of murrelets and murrelet productivity in the nearby San Juan Islands.

• Summary of results
  • Murrelet numbers were variable within and among years, but there was no evidence of a trend, either increasing or decreasing. The amount of potential nesting habitat on the Olympic Peninsula also did not change during the study period.
  • Murrelet counts from radar were not significantly correlated with counts and productivity ratios from at-sea surveys. Neither radar counts nor at-sea surveys showed evidence of a trend in murrelet populations over the study period. Suggests that radar may be valuable to assess murrelet use of individual drainages, and as an independent assessment of abundance to compare with data collected from at-sea surveys.


• Summary of methods
  • The methods are similar to those below in Raphael et al. 2016, where murrelet density estimates from at-sea surveys (from the effectiveness monitoring program) were used to assess the influence of terrestrial (n =3) and oceanographic (n = 17) factors on murrelet densities, from Washington to California.

• Summary of results
  • Similar to Raphael et al. 2016, murrelet densities were most strongly influenced by the abundance and cohesion of murrelet nesting habitat (old forests). From Washington to California, murrelets seem to concentrate in areas with the most abundant and cohesive nesting habitat.


• Summary of methods
  • Compared habitat characteristics at 18 marbled murrelet nests that were located by radio tracking, 2004 to 2008. Compared habitat between nests and control plots around nests, to ascertain whether murrelets selected particular habitat features. This is the first study with to use telemetry to locate murrelet nests in Washington. This is important because telemetry is currently the least biased method for locating murrelet nests.

• Summary of results
  • For nests in Washington, all nests were in protected federal reserves, mostly on the Olympic Peninsula.
- Nest trees were larger diameter than those in surrounding stands, and averaged 136.5 cm DBH. Nest trees also had larger crown areas and more large platforms (limbs or limb deformities >10 cm diameter), and nest limbs were exceptionally large.
- Overall, these findings confirm observations from past studies, that murrelets select pristine, contiguous old growth forest reserves for nesting, and within such forests they tend to select the largest trees available.


- **Summary of methods**
  - At-sea surveys for marbled murrelets were conducted annually from 2000 to 2013 from Washington to California for the purpose of monitoring trends in murrelet populations. These surveys represent the results of murrelet effectiveness monitoring for the Northwest Forest Plan (NWFP). They provide the most comprehensive information on at-sea densities and abundances of murrelets (during the murrelet breeding season) within threatened portion of the murrelets range (Washington to California). Details on sampling design and analysis are on p. 3–13.

- **Summary of results:** Estimates of murrelet population size for each year and state are provided on p. 18, Table 1-3. Estimates of trend for each state are provided on p. 20 Table 1-4.
  - **Washington:** Murrelet population size in Washington was estimated to be 5,665 (95% confidence interval: 3,217-8,114). From 2000 to 2013, there was strong evidence of a declining trend; the annual rate of change in murrelet densities was estimated at -4.6% (95% confidence interval: -7.5 to -1.5%).
  - **Oregon:** Murrelet population size in Oregon was estimated to be 9,819 (95% confidence interval: 6,158-13,480). From 2000 to 2013, there was no evidence of a trend, either increasing or decreasing in Oregon; the annual rate of change in murrelet densities was estimated at 0.3% (95% confidence interval: -1.8 to 2.5), but the estimate confidence interval overlapped zero indicating the evidence for a trend was not conclusive.
  - **California:** Murrelet population size in California was estimated to be 4,178 (95% confidence interval: 3,561-4,795). From 2000 to 2013, there was no evidence of a trend in California, either increasing or decreasing; the annual rate of change in murrelet densities was estimated at 2.5% (95% confidence interval: -1.1 to 6.2), but the estimate confidence interval overlapped zero indicating the evidence for a trend was not conclusive.
  - **All states combined:** Murrelet population size from Washington to California was estimated at 19,700 (95% confidence interval: 15,400-23,900) for the most recent year, 2013. From 2000 to 2013, there was no evidence of a trend, either increasing or decreasing; the annual rate of change in murrelet densities was
estimated at -1.2% (95% confidence interval: -2.9 to 0.5), but the estimate confidence interval overlapped zero indicating the evidence for a trend was not conclusive.

- Conclusion: The murrelet population within the NWFL area is not stable or increasing.


- Summary of methods
  - Models of murrelet nesting habitat were developed for the NWFL area based on vegetation and physiographic attributes of known nests sites (n = 184) and occupied sites (n = 184; sites where potential breeding activity were observed, but a nest site was not found or confirmed). Trends in nesting habitat were assessed by comparing nesting habitat between 1993 and 2012, and incorporating models of habitat loss from disturbance events (e.g., fire, timber harvest). Details on analytical approach are on p. 38-56.

- Summary of results: The estimated amount of nesting habitat for each state for 1993 and 2012 are provided on p. 69, Table 2-8, and changes in nesting habitat 1993 versus 2012 are on p. 79, Table 2-10. The proportion of nesting habitat lost to timber harvest and other factors is presented on p. 80-81, Table 2-12 and 2-13.
  - **Washington:** In 2012, Washington contained an estimated 1,343,200 acres of higher suitability murrelet nesting habitat (Table 2-8). This habitat declined from 1993 to 2012 by 13.3% (Table 2-10). Most losses occurred on nonfederal land (Table 2-10) and were attributed to timber harvest (total of 200,658 acres lost from timber harvest on nonfederal lands in Washington; Table 2-13).
  - **Oregon:** In 2012, Oregon contained an estimated 774,700 acres of higher suitability murrelet nesting habitat, compared to 853,400 acres in 1993 (Table 2-8). Higher suitability nesting habitat in Oregon declined from 1993 to 2012 by 9.2%, for a total loss of 78,595 acres (Table 2-10). Most losses occurred in the Coast Range (53,839 acres) and Klamath (24,741 acres) (Table 2-10). The biggest losses of nesting habitat on federal lands were associated with wild fires, particularly the 2002 Biscuit Fire in the Klamath physiographic province. The total loss from wild fire was 20,235 acres of higher suitability murrelet nesting habitat. For non-federal land, the biggest losses were attributed to timber harvest, for a total loss of 88,065 acres. Most habitat loss from timber harvests occurred in the Oregon coast range (80,049 acres) (Table 2-12, 2-13).
  - **California:** In 2012, California contained very little higher suitability nesting habitat, or an estimated 108,900 acres (Table 2-8). This habitat declined from 1993 to 2012 by 17.8% (Table 2-10). Virtually all losses occurred on nonfederal land (Table 2-12, 2-13) and were attributed to timber harvest (total of 20,024 acres lost from timber harvest on nonfederal lands in California; Table 2-13).
• **All states combined:** Murrelet nesting habitat declined from 2,535,000 to 2,226,800 acres between 1993 and 2012, or a loss of 12.1%. Most losses were associated with timber harvest on nonfederal lands, which totaled 308,747 acres.

  - **Conclusion:** The NWFP has been successful in conserving the majority (>97%) of remaining suitable habitat on federal lands. Most nesting habitat losses have occurred on non-federal lands due to timber harvest.


  - **Summary of methods**
    - Objective was to relate the amount and distribution of murrelet nesting habitat to at-sea densities and trends, and assess the extent to which ocean conditions (versus nesting habitat) impact murrelet abundances. This is to assess whether nesting habitat can be used to monitor murrelet trends and populations, which was one of the original goals of the NWFL. Analytical approach is described on p. 96-101, variables included in model are on p. 99, Table 3-1.

  - **Summary of results**
    - The amount and cohesion of potential nesting habitat had the strongest influence on murrelet abundance, compared to the ocean conditions that were included in the analysis (Figure 3-9). While this does not mean that ocean conditions do not influence murrelets, it does suggest that nesting habitat is important for murrelet distributions in the breeding season.
    - Trends in nesting habitat were more strongly associated with murrelet trends than ocean conditions.


  - **Summary of methods**
    - Objective was to model marine habitat selection by marbled murrelets that were radio tracked in large PNW telemetry study, 2004 to 2008. Dataset consisted of 157 tagged murrelets that were tracked during the breeding season in Washington marine waters (primarily, in 4 study areas (1) Strait of Juan de Fuca, (2) San Juan Islands, (3) Hood Canal, and (4) Pacific Coast/Ocean).

  - **Summary of results**
    - Marbled murrelets selected nearshore habitats that had lower human footprint – in other words, they avoided marine areas with a lot of on-shore human development. Other variables that were important in habitat selection, by order of importance, included (1) the amount of nesting habitat nearby (murrelets selected areas near large amounts of nesting habitat), and (2) sea surface temperature (murrelets selected cooler waters over warmer waters).

- Summary of methods
  - Objective was measure murrelet home range size and distances that murrelets commuted between nest and forage locations (for breeding murrelets), for birds that were radio tracked in large PNW telemetry study, 2004 to 2008. Dataset consisted of 157 tagged murrelets that were tracked during the breeding season in Washington marine waters (primarily, in 4 study areas (1) Strait of Juan de Fuca, (2) San Juan Islands, (3) Hood Canal, and (4) Pacific Coast/Ocean).

- Summary of results
  - Median marine range size was 487 km², which is larger than ranges reported in Alaska where murrelets are not threatened, and where marine conditions are thought to be more favorable.
  - Murrelets had very low rates of breeding. An estimated 13-20% of murrelets attempted to nest, which is the lowest rate of breeding reported for radio-tagged murrelets anywhere in their range. Four of 157 tagged murrelets successfully fledged young.
  - Nesting murrelets traveled longer distances over land and over water than other populations that have been studied in Alaska and British Columbia. Implications are that terrestrial and marine habitat in Washington is poor for murrelets.
  - A comparison of space use by murrelets using different study areas showed that murrelets along the Pacific Coast of Washington had larger ranges, and frequently left the coast to forage in inland waters (particularly, in the San Juan Islands, and Strait of Juan de Fuca). No murrelets captured on the coast ever attempted to nest. This indicates that conditions along the Pacific Coast are poor compared to those in the interior waters of the Salish Sea.
Hi Christina
We do not have a lot of recent information on Marbled murrelets, but I thought I would share with you the attached state ranking form that I completed in 2016. I ran it by Kim Nelson and she agreed that S2 is likely an appropriate rank for this species. S2 means that the species is very vulnerable to extirpation. Let me know if you need clarification on the ranking process.

I also wanted to remind you that ODFW does have in-house access to our rare species data (Biotics) and point observation database (PODS). There are not many recent records in Biotics, but what is there might be helpful. I believe the version of PODS that we send out does not have rare species included. We do have a few recent (post 2000) point observations that have not made it into our Biotics database. None of these records are in unexpected places, but let me know if you need more information on them. They are in my ever-growing to-do pile.

Best, Eleanor

On Mon, Mar 27, 2017 at 4:57 PM, ODFW Marbled Murrelet <odfw.marbledmurrelet@state.or.us> wrote:

Dear Interested Party,

This is a reminder that the Oregon Department of Fish and Wildlife (ODFW) is seeking scientific information or other data that would assist in evaluating the status of the Marbled Murrelet in Oregon. ODFW is particularly interested in information on Marbled Murrelet biology, population trends and demographics, marine and terrestrial habitat conditions, threats, and the adequacy of state and federal programs or regulations.

If you wish to submit information, please send it by close of business on April 7, 2017. Information may be emailed to odfw.marbledmurrelet@state.or.us or mailed to ODFW, Marbled Murrelet, 4034 Fairview Industrial Drive SE, Salem, OR 97302. Note that information submitted, including names and addresses, may become part of the public record.

More information about Marbled Murrelets and the ODFW status review process is available at: http://www.dfw.state.or.us/wildlife/hot_topics/marbled_murrelet.asp.

Thank you for considering this request.

Best Regards,
Christina Donehower  
Strategy Species Coordinator  
Oregon Department of Fish and Wildlife  
4034 Fairview Industrial Drive SE  
Salem, OR 97302  
(503) 947-6099

If you believe that you have received this message in error, please notify us so that we can direct this information to the appropriate person.

--  
Eleanor P. Gaines  
Zoology Projects Manager  
Oregon Biodiversity Information Center  
Institute for Natural Resources  
Portland State University  
PO Box 751  
Portland, OR 97207  
503-725-9952 - phone  
http://inr.oregonstate.edu
Heritage Ranking Form - State Rank

Scientific Name: Brachyramphus marmoratus
Common Name: Marbled murrelet
Classification: Vertebrate Animal

Heritage Rank: S2B

Rank Date: 2/16/2016
Comments: Marbled murrelets are vulnerable to habitat loss, gill-net fishing, oil spills. Persistent decline in population.

Range Extent: E = 5,000-20,000 sq km (~2,000-8,000 sq mi)
Comments: 19,228 sq km.

Population Size: E = 2,500 - 10,000 individuals
Comments: 18,000 individuals in Oregon, Washington and California (Falxa et al. 2009, Peery et al. 2008), and productivity in these states is low (USFWS 2009).

Number of Occurrences: 0
Comments: None

Area of Occupancy: F = 126-500 4-km² grid cells
Comments: 275 4sqkm grid squares occupied.

Good Viability: D = Some (13-40) occurrences with excellent or good viability or ecological integrity
Comments: Remaining viable occurrences largely limited to federal lands.

Environmental Sensitivity: Not Evaluated
Comments: None

Short Term Trends: F = Decline of 10 - 30%
Comments: None

Long Term Trends: E = Decline of 30 - 50%
Comments: Decline of 30% over the last 9 years.

Threat Impact: B = High
Calculated Threat Comments: Logging, habitat loss, gill-nets, oil spills, marine pollution all threaten Marbled Murrelets.

Assigned Threat Comments: None

**Intrinsic Vulnerability:** Not Evaluated

Comments: None

Rank Notes: Calculator Rank (unrevised)=S2.

From: Eleanor Gaines [mailto:egaines@pdx.edu]
Sent: Thursday, April 06, 2017 5:55 PM
To: Christina E Donehower <christina.e.donehower@state.or.us>
Subject: Fwd: MAMU

Hmmm. This bounced back to me. I'm re sending in two parts.
---------- Forwarded message ---------
From: Eleanor Gaines <egaines@pdx.edu>
Date: Thu, Apr 6, 2017 at 5:48 PM
Subject: MAMU
To: Christina E Donehower <christina.e.donehower@state.or.us>

Hi Christina
The week has got away from me. I am attaching a copy of our element rank calculator as well as some documentation on its use. I find the status factors document particularly useful (the doc with the polar bear on the cover). The sources I used are in the calculator (see the references tab).
I'm also including a bunch of reports I had, that are probably duplicates for you.
I know I have communication with Kim Nelson, where we discussed the S2 rank for murrelets and she agreed it was correct, but I have not been able to find it. I'll look in the morning when I am fresh!
Sorry for the delay on this. Eleanor

--
Eleanor P. Gaines
Zoology Projects Manager
Oregon Biodiversity Information Center
Institute for Natural Resources
Portland State University
PO Box 751
Portland, OR 97207
503-725-9952 - phone
http://inr.oregonstate.edu

--
Eleanor P. Gaines

Available:
http://www.natureserve.org/sites/default/files/publications/files/
natureserveconservationstatusmethodology_jun12_0.pdf


Available:
http://www.natureserve.org/sites/default/files/publications/files/
natureserveconservationstatusfactors_apr12_1.pdf
Remember to adopt a moderate attitude, taking care to identify the most likely plausible range of values, excluding extreme or unlikely values. Change to return GRanks, NRanks, or Sranks: S change using dropdown; also affects Calculator Table.

Enter values below, text in off-white and light-green cells and dropdowns in yellow and blue cells. Scroll down in dropdowns for additional choices. To clear an individual value, put your cursor in the drop-down cell and press Delete.

<table>
<thead>
<tr>
<th>Factor Groups with Weights</th>
<th>Species or Ecosystem Scientific Name</th>
<th>Type (enter “infraspecies” for a T-Rank)</th>
<th>Spatial Pattern (for ecosystems only)</th>
<th>Optional Information:</th>
<th>Element ID</th>
<th>COMMENTS (Place cursor in cell to see full text.)</th>
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<tbody>
<tr>
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<td>Brachyramphus marmoratus</td>
<td>Species</td>
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</thead>
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<tr>
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<td>Marbled murrelet</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

| Range Extent                          | E               | E = 5,000-20,000 sq km (~2,000-8,000 sq mi) | 19,228 sq km. |
|                                        | F               | FILL OUT ONLY 1 OF FOLLOWING 3 FIELDS |                                     |
|                                        | F               | F = 126-500 4-km2 grid cells |                                     |
|                                        | F               | F = 275 4sqkm grid squares occupied. |                                     |

| Population Size*                      | E               | E = 2,500 - 10,000 individuals | 18,000 individuals in Oregon, Washington and California |
|                                        | F               | FILL OUT ONLY 1 OF FOLLOWING 2 FIELDS |                                     |
|                                        | D               | D = Some (13-40) occurrences with excellent or good viability or ecological integrity | Remaining viable occurrences largely limited to federal lands. |
|                                        | D               | D = 126-500 4-km2 grid cells |                                     |

| Number of Occurrences                  | D               | D = Some (13-40) occurrences with excellent or good viability or ecological integrity | Remaining viable occurrences largely limited to federal lands. |
|                                        | F               | F = 126-500 4-km2 grid cells |                                     |
|                                        | F               | F = 275 4sqkm grid squares occupied. |                                     |

| Abund./Cond.                           | B               | B = High | Logging, habitat loss, gill-nets, oil spills, marine pollution |
|                                        | D               | D = High |                                           |

| Threats                                | X               | 0.3       |                                           |
|                                        |                |           |                                           |

| Environmental Specificity (opt.)        | B               | B = High | Logging, habitat loss, gill-nets, oil spills, marine pollution |
|                                        | D               | D = High |                                           |

| Intrinsic Vulnerability (opt.)          | B               | B = High |                                           |
|                                        | D               | D = High |                                           |

| Assigned Overall Threat Impact (FYI)    | B               | B = High |                                           |
|                                        | D               | D = High |                                           |

| Short-term Trend                        | F               | F = Decline of 10 - 30% |                                           |
|                                        | E               | E = Decline of 30 - 50% | Decline of 30% over the last 9 years. |

| Long-term Trend                         | F               | F = Decline of 10 - 30% |                                           |
|                                        | E               | E = Decline of 30 - 50% | Decline of 30% over the last 9 years. |

| Minimum factors requirement met?        | TRUE            |                      |                                           |

Calculated Rank                          | S2              | Always review the calculated rank. |
Assigned Rank**                           | S2B             | Adjusted Rank         |

Always review the calculated rank. Assigned Rank Reasons Marbled murrelets are vulnerable to habitat loss, gill-net fishing, oil spills. Persistent decline in population.

Rank Factor Ratings Author Pahl, Cameron and E. Gaines
Rank Factor Ratings Date 24-Mar-2016 | Enter Ctrl-semicolon (;) for today's date.
Rank Assignment Author Pahl, Cameron and E. Gaines
Rank Review Date 24-Mar-2016 | Enter Ctrl-semicolon (;) for today's date.
Rank Calculator Internal Notes

*Do not enter a coded value for Population Size if it is not meaningful in calculating a conservation status. Instead, leave the coded value blank and enter a reason in the Population Size Comments field. If desired, the “Population Size Estimate” field can be used to record a numerical estimate of the population size.
The coded value for Population Size should be left blank for species where a large number of individuals indicate a sense of security that is not warranted. Examples include invertebrates for which thousands to millions of individuals occur in a very small area, and annual plants dependent on seed banking. See Master et al. (2012) for more information.

**In this field, accept the calculated rank by entering it, OR assign a qualified rank, or rarely, an adjusted rank.**

If you qualify or adjust the Calculated Rank, be sure to document the details in the 'Rank Adjustment Reasons' field.

Qualifying a Calculated Rank:
- **Q (Questionable taxonomy) qualifier (Global ranks only):** If distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable, and resolution of this uncertainty may result in a lower-priority (numerically higher) conservation status, the calculated rank can be qualified by adding a Q after the G#.
- **C (Captive or Cultivated only) qualifier (Global ranks only):** If the species at present is extinct in the wild across its entire native range but is extant in cultivation, in captivity, as one or more naturalized populations outside its native range, or as a reintroduced population not yet established, qualify the calculated rank by adding a Q after the G#. Similarly, if an ecosystem at present is eliminated in the wild across its entire native range, but is extant, but not full established, in restorations within that native range, qualify the calculated rank by adding a Q after the G#.

Adjusting the Calculated Rank:
- **CALCULATED RANKS SHOULD ONLY RARELY BE ADJUSTED, AND ONLY WITH SUFFICIENT DOCUMENTATION AND PEER REVIEW**
- **Rescue Effect (Subnational or National ranks only):** If the jurisdictional population being assessed experiences significant immigration of propagules capable of reproducing in the jurisdiction, resulting in a lower extinction risk, the calculated rank may be raised to indicate lower priority by a half step or more (most commonly one step, e.g., from S2 to S3). In exceptional cases, lowering the rank may be appropriate, if the population within the jurisdiction is a demographic sink that is unable to sustain itself without immigration, AND if the immigration is expected to decrease.

- **Comparison to Global and National/Subnational Rank** information is useful when assigning conservation status, especially when the national/subnational information is more current or detailed than the global information or vice versa. Global and national/subnational ranks are designed to be used together (e.g., G4S2) in national/subnational reports so as to provide a more complete picture of the conservation status of a species or ecosystem in the geographic area (nation, state, province) of interest. Historically, a national/subnational rank that implied that a species/ecosystem was more imperiled at a global level than it was at a local level was not acceptable. For example, G1S3 was invalid, since in principle a species or ecosystem could not be ‘vulnerable’ to elimination at a global level but at the same time ‘apparently secure’ at a subnational level. This rule is under review because current status assessment methods provide a more explicit role for Threats and Trends, which may indicate low levels of risk at national/subnational scales as compared to global scales, and a one rank difference may be permissible (e.g., G1S2).

- **Other** reasons which might rarely indicate that a calculated rank needs adjustment include ecological considerations or specific life history traits (e.g., extreme r- or k-selected species), or additional information useful for assessing conservation status. You must enter reasons for adjusting a calculated rank in the 'Rank Adjustment Reasons' field.

For more information on reviewing and assigning ranks see "Conservation Status Assessments: Methodology for Assigning Ranks" (Faber-Langendoen et al. 2012).
<table>
<thead>
<tr>
<th>Species or Community</th>
<th>Scientific Name</th>
<th>Type (infrasp for TRank)</th>
<th>Spatial Pattern (ecosystems only)</th>
<th>Elcode</th>
<th>Element ID</th>
<th>Common Name</th>
<th>Classification</th>
<th>Nation or Subnation (for N- for S- Ranks)</th>
<th>Extent</th>
<th>Area of Occupancy</th>
<th>Area of Occupancy 4-km² grid cells</th>
<th>Area of Occupancy 1-km² grid cells</th>
<th># of Occurrences</th>
<th>Population Size</th>
<th>Good Viability/Integrity</th>
<th>Environmental Specificity</th>
<th>Threat Impact</th>
<th>Threat Impact Adjustment Reasons</th>
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<tbody>
<tr>
<td>Brachyramphus marmoratus</td>
<td>S2B</td>
<td>Vertebrate An</td>
<td>Oregon E F D B B F E</td>
<td>Marbled murrelet</td>
<td>19,228 sq km.</td>
<td>275 4sqkm grid</td>
<td>18,000 individuals</td>
<td>Remaining viable</td>
<td>Logging, habitat degradation</td>
<td>Decline of 30%</td>
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<td>7</td>
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</tbody>
</table>

To reorder results: copy data excluding headers and gray columns; paste into a new sheet; sort by scientific name; then paste back into existing or new sheet.
### Threats Assessment Worksheet

See instructions on previous tab. Scroll down in bottom pane to view the entire table.

You MUST MANUALLY enter scope & severity for Level 1 threats. There is no automatic rollup of lower-level threats, and only Level 1 threats are included in the Overall Threat Impact calculation.

<table>
<thead>
<tr>
<th>Species or Ecosystem Scientific Name</th>
<th>Brachyramphus marmoratus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element ID</td>
<td>Elcode ABNN06010</td>
</tr>
</tbody>
</table>

Overall Threat Impact Calculation Help:

<table>
<thead>
<tr>
<th>Threat Impact</th>
<th>high range</th>
<th>low range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Very High</td>
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</tr>
<tr>
<td>B High</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C Medium</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D Low</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Calculated Overall Threat Impact:

#N/A #N/A

Assigned Overall Threat Impact:

Overall Threat Impact Adjustment Reasons:

Fill out Overall Threat Impact Comments directly on the Calculator Form.

<table>
<thead>
<tr>
<th>Threat</th>
<th>Impact (calculated)</th>
<th>Scope</th>
<th>Severity</th>
<th>Timing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>No known threats</td>
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<td>Unknown/undetermined</td>
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<tr>
<td>1 Residential &amp; commercial development</td>
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<tr>
<td>1.1 Housing &amp; urban areas</td>
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<td>1.3 Tourism &amp; recreation areas</td>
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<td>2 Agriculture &amp; aquaculture</td>
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<td>2.1 Annual &amp; perennial non-timber crops</td>
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<td>2.3 Livestock farming &amp; ranching</td>
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<td>2.4 Marine &amp; freshwater aquaculture</td>
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<td>3 Energy production &amp; mining</td>
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<td>3.3 Renewable energy</td>
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<td>4 Transportation &amp; service corridors</td>
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<td>4.1 Roads &amp; railroads</td>
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<td>4.2 Utility &amp; service lines</td>
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<td>4.3 Shipping lanes</td>
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</tr>
<tr>
<td>4.4 Flight paths</td>
<td></td>
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<tr>
<td>5 Biological resource use</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5.1 Hunting &amp; collecting terrestrial animals</td>
<td></td>
<td></td>
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<tr>
<td>5.2 Gathering terrestrial plants</td>
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<tr>
<td>5.3 Logging &amp; wood harvesting</td>
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<tr>
<td>5.4 Fishing &amp; harvesting aquatic resources</td>
<td></td>
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<tr>
<td>6 Human intrusions &amp; disturbance</td>
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<tr>
<td>6.1 Recreational activities</td>
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<tr>
<td>6.2 War, civil unrest &amp; military exercises</td>
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<tr>
<td>6.3 Work &amp; other activities</td>
<td></td>
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<tr>
<td>7 Natural system modifications</td>
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</tr>
<tr>
<td>7.1 Fire &amp; fire suppression</td>
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<tr>
<td>7.2</td>
<td>Dams &amp; water management/use</td>
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<td>7.3</td>
<td>Other ecosystem modifications</td>
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<tr>
<td>8</td>
<td>Invasive &amp; other problematic species, genes &amp; diseases</td>
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<td>8.1</td>
<td>Invasive non-native/alien species/diseases</td>
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<td>Problematic native species/diseases</td>
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<td>8.3</td>
<td>Introduced genetic material</td>
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<tr>
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<td>Problematic species/diseases of unknown origin</td>
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<td>8.5</td>
<td>Viral/prion-induced diseases</td>
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<tr>
<td>8.6</td>
<td>Diseases of unknown cause</td>
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<td>9</td>
<td>Pollution</td>
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<tr>
<td>9.1</td>
<td>Domestic &amp; urban waste water</td>
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<tr>
<td>9.2</td>
<td>Industrial &amp; military effluents</td>
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<td>9.3</td>
<td>Agricultural &amp; forestry effluents</td>
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<tr>
<td>9.4</td>
<td>Garbage &amp; solid waste</td>
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<tr>
<td>9.5</td>
<td>Air-borne pollutants</td>
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<td>9.6</td>
<td>Excess energy</td>
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<td>Geological events</td>
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<td>Volcanoes</td>
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<tr>
<td>10.2</td>
<td>Earthquakes/tsunamis</td>
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<td>10.3</td>
<td>Avalanches/landslides</td>
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<td>11</td>
<td>Climate change &amp; severe weather</td>
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<tr>
<td>11.1</td>
<td>Habitat shifting &amp; alteration</td>
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<tr>
<td>11.2</td>
<td>Droughts</td>
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<td>11.3</td>
<td>Temperature extremes</td>
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<td></td>
<td></td>
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<tr>
<td>11.4</td>
<td>Storms &amp; flooding</td>
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<tr>
<td>11.5</td>
<td>Other impacts</td>
<td></td>
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<td>12</td>
<td>Other options</td>
<td></td>
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<tr>
<td>12.1</td>
<td>Other threat</td>
<td></td>
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</tbody>
</table>

Classification of Threats follows IUCN - CMP Unified Classification of Direct Threats Version 3.2.
### Threats Data Compiled

This sheet stores data from the Threats Assessment Worksheet for multiple species or ecosystems.

It is not intended for data entry.

On this tab (unlike others), you can delete rows to delete data.

<table>
<thead>
<tr>
<th>Species or Ecosystem Sc</th>
<th>Element</th>
<th>Ecode</th>
<th>Overall Threat</th>
<th>Overall Threat Adjusted</th>
<th>Threat</th>
<th>Threat Description</th>
<th>Threat Impact</th>
<th>Scope</th>
<th>Severity</th>
<th>Timing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 2</td>
<td>Agriculture &amp; aquaculture</td>
<td>D</td>
<td>Low</td>
<td>Small (1-10%)</td>
<td>Slight or 1-10% pop. decline</td>
<td>Gill-net fishing</td>
<td></td>
</tr>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 2.4</td>
<td>Marine &amp; freshwater aquaculture</td>
<td>D</td>
<td>Low</td>
<td>Small (1-10%)</td>
<td>Slight or 1-10% pop. decline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 5</td>
<td>Biological resource use</td>
<td>B</td>
<td>High</td>
<td>Large (31-70%)</td>
<td>Serious or 31-70% pop. decline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 5.3</td>
<td>Logging &amp; wood harvesting</td>
<td>B</td>
<td>High</td>
<td>Large (31-70%)</td>
<td>Serious or 31-70% pop. decline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 7</td>
<td>Natural system modifications</td>
<td>D</td>
<td>Low</td>
<td>Restricted (11 Slight or 1-10% pop. decline)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 7.1</td>
<td>Fire &amp; fire suppression</td>
<td>D</td>
<td>Low</td>
<td>Restricted (11 Slight or 1-10% pop. decline)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachyramphus marmor</td>
<td>ABNNN06010 B</td>
<td>B</td>
<td>8</td>
<td>Logging, habit 9</td>
<td>Pollution</td>
<td>D</td>
<td>Low</td>
<td>Small (1-10%)</td>
<td>Slight or 1-10% pop. decline</td>
<td>Oil Spills</td>
<td></td>
</tr>
</tbody>
</table>


http://www.biologicaldiversity.org/species/birds/marbled_murrelet/CBD-MAMU-90-day-comments.html


Reference to Print:
Instructions: Type species name into Column A as it is shown in the Calculator Form G10 and list each reference in Column B. You can sort on Column A and B to reorder. Do not change E1 or F1. Click "Reference to Print" button to transfer references for your active species in the Calculation Form to the Print tab.
Executive Summary

Primary Goal: To assess the conservation status of species and ecosystems—specifically the extinction risk of species and elimination risk of ecosystems at global scales, and their extirpation risk at national and subnational scales—using standard methods. NatureServe and Natural Heritage program staff across North America collect and evaluate data for species and ecosystems of concern using these methods and tools to ensure that assigned status ranks are accurate and consistent, based on current field and remote sensing information.

Rank Factors (see Master et al. 2012)
- Eight core status rank factors are identified as relevant to risk assessments of extinction/elimination or extirpation.
- Descriptions of each factor include the basis for its use and its evaluation and rating criteria.

Methods (see Faber-Langendoen et al. 2012)
- Factors are organized into three categories (rarity, threats, and trends).
- Conditional rules for use of factors are applied to ensure that adequate information is used for assessing status.
- Factors are scaled and weighted according to their impact on risk.
- Consistent factor scaling and weighting allows the use of points to effectively score the contribution of each factor to risk.
- Scores are weighted and combined by category resulting in an overall calculated rank, which is reviewed, and a final conservation status rank assigned.

Tools
- A rank calculator automates the process of assigning conservation status ranks (NatureServe 2012, provided here).
- NatureServe’s Biotics database provides management for all conservation status information.

Suggested Citation

Acknowledgments
This Rank Calculator provides a tool for assigning a conservation status rank to all elements of biodiversity tracked by NatureServe. The calculator has been developed by the Element Ranking Work Group, which was formed in 2004; current members are Don Faber-Langendoen and Margaret Ormes (co-chairs), and (in alphabetical order) Marilyn Anions, Roxanne Bittman, Geoff Hammerson, Bonnie Heidel, Larry Master, Jennifer Nichols, Leah Ramsay, Andy Teucher, Adele Tomaino, Ben Wigley (NCASI), and Bruce Young. Kristin Snow provided the programming skills and feedback to the working group on how best to implement the Rank Calculator. Past members include the late Larry Morse (who, with Adele Tomaino, helped create Version 1 of the rank calculator), Paul Hendricks, Steve Rust, and Troy Weldy. We appreciate their contributions to this project.

We thank all those in the NatureServe network who for many years have been applying the ranking methodology to species and community element types. Their ongoing advice has helped us think through many of the issues we needed to address in refining our methods. Most recently, the calculator has been extensively reviewed by several staff of network member programs. Participants at the National Center for Ecological Analysis and Synthesis (NCEAS) workshops (2000-2004) advised NatureServe on methods for assessing extinction risk. Funding for the most recent revisions has been generously provided by the National Council for Air and Stream Improvement (NCASI), Office Depot, U.S. Fish and Wildlife Service, U.S. Forest Service, the Sarah K. de Coizart Article TENTH Perpetual Charitable Trust, an anonymous donor, and in-kind contributions from NatureServe and member programs.

Front cover artwork: “Rustico Beach Dunes” (detail), Carol Fogelsong 2008.

References


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Version 3.185, January 13, 2015
### Workbook Sheets (use tabs at bottom of workbook to switch among sheets):

<table>
<thead>
<tr>
<th>Summary &amp; Acknowledgments</th>
<th>Contains the Executive Summary, suggested citation, references, and recognition for members of the Element Ranking Work Group and others that have contributed to the updated methodology and development of the rank calculator.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions &amp; Rules Reference</td>
<td>Provides basic information on how to use the rank calculator, and summarizes the rules applied to generate a calculated status rank.</td>
</tr>
<tr>
<td>Factors Reference</td>
<td>Summarizes the status factors and rating values. (Prints on 2 pages.)</td>
</tr>
<tr>
<td>Calculator Form</td>
<td>In cases when no existing factor ratings data have been recorded in NatureServe's Biotics data management system for import, the form is used for entering status factor ratings for a single species or ecosystem at a time and generating a calculated rank. Details of the automated calculation process can be viewed most easily using this form. A row from the Calculator Table can be imported into this form for better viewing. The calculated rank changes with each edit that is made to data in the form. <strong>Buttons:</strong> &quot;Copy Data to Calculator Table&quot; copies the data from this form to a new row on the Calculator Table worksheet; &quot;Clear Form&quot; removes all data from this form. <strong>Caution:</strong> the &quot;Copy Data to Calculator Table&quot; button does not check existing records in the Calculator Table to prevent creating duplicate rows; it is up to the user to do so.</td>
</tr>
<tr>
<td>Calculator Table</td>
<td>Stores factor data, either imported from Biotics or transferred from the Calculator Form, for multiple species and ecosystems in tabular format. The calculated rank changes with each edit that is made to data in the Calculator Table. <strong>Buttons:</strong> &quot;Copy Selected Row to Calculator Form&quot; replaces data existing in the Calculator Form with the selected row; &quot;Cautions&quot; provides important information about using this table, which you are advised to read. <strong>Caution:</strong> The Calculator Table is not designed for data entry and contains no data validation of rank factor values.</td>
</tr>
<tr>
<td>Threats Instructions</td>
<td>Provides information on how to use the Threats Assessment worksheet.</td>
</tr>
<tr>
<td>Threats Assessment</td>
<td>Used to automatically calculate the rating for the Overall Threat Impact status factor based on scope and severity values entered for individual threats. An overall threat impact is automatically calculated, but you must verify or change the calculated value by selecting a value in the &quot;Assigned Overall Threat Impact&quot; cell. <strong>Buttons:</strong> &quot;Copy Data to Threats Data Compiled&quot; copies the data from this form to new rows on the Threats Data Compiled worksheet; &quot;Clear Form&quot; removes all data from this form; &quot;Copy Overall Impact and Adjustment Reasons to Calculator Form&quot; copies the Assigned Overall Threat Impact rating and Overall Threat Impact Adjustment Reasons to the Calculator Form. <strong>Caution:</strong> You must manually enter scope &amp; severity for Level 1 threats. There is no automatic rollup of lower-level threats, and only Level 1 threats are included in the Overall Threat Impact calculation.</td>
</tr>
<tr>
<td>Threats Data Compiled</td>
<td>Stores threats data, either imported from Biotics or transferred from the Threats Assessment Worksheet, for multiple species and ecosystems in tabular format. <strong>Buttons:</strong> &quot;Cautions&quot; provides important information about using this table, which you are advised to read before copying data to the Threats Assessment Worksheet; &quot;Copy Selected Rows to Threats Assessment&quot; replaces data existing in the Threats Assessment Worksheet with the selected rows.</td>
</tr>
<tr>
<td>Biotics Export/Import Sheets</td>
<td>Provide SQL queries and instructions for exporting global or subnational status factor ratings from Biotics into the rank calculator, ... for Biotics installations that have been updated to use the new (2011) methodology use in this calculator. ... for Biotics installations that have NOT been updated to use the new (2011) methodology. These queries automatically convert the existing ratings that were assigned under the previous methodology to the equivalent new values during the export process. Provides information to be considered regarding data import from the rank calculator into Biotics. Data from the rank calculator should not be imported into Biotics until the database includes the structure required to manage data for the updated methodology. <strong>for Version 2 users</strong> Contains information on changes made to the rank calculator since v2.0 (2010) and whether they affect rank calculation.</td>
</tr>
<tr>
<td>Biotics Export/Import Sheets</td>
<td>Provide SQL queries and instructions for exporting global or subnational status factor ratings from Biotics into the rank calculator, ... for Biotics installations that have been updated to use the new (2011) methodology use in this calculator. ... for Biotics installations that have NOT been updated to use the new (2011) methodology. These queries automatically convert the existing ratings that were assigned under the previous methodology to the equivalent new values during the export process. Provides information to be considered regarding data import from the rank calculator into Biotics. Data from the rank calculator should not be imported into Biotics until the database includes the structure required to manage data for the updated methodology. <strong>for Version 2 users</strong> Contains information on changes made to the rank calculator since v2.0 (2010) and whether they affect rank calculation.</td>
</tr>
<tr>
<td>Hidden Sheets</td>
<td>(The curious can display these by right-clicking on any tab below and selecting Unhide, but do not edit them; they affect the calculation.) <strong>RULES</strong> Ranking rules and the points and weights which are used in the calculations in the other tabs. <strong>Calculate</strong> Calculation of the rank score from weighted factor points. <strong>Rk Assign tab</strong> The calculated rank score is converted into a Global Rank.</td>
</tr>
</tbody>
</table>
Summary of Rules

Return GRanks, NRanks or SRanks? S
If G then GRanks and TRanks will be calculated; if N or S then NRanks or SRanks will be calculated. The only difference is in which letter precedes the number in the rank. You can change this on the "Calculator Form" tab; the choice is applied to ALL ranks in the calculator.

Minimum Factors Requirement
To calculate a rank, there must be a value for 1 factor from each of 2 out of 3 factor groups:
- Rarity1 (Range/Distribution): Range Extent, Area of Occupancy
- Rarity2 (Abundance/Condition): # of Occurrences, # of Occurrences or Percent Area with Good Viability/Ecological Integrity, Population Size
- Threats/Trends: Overall Threat Impact, Short-term Trend, Long-term Trend

*Environmental Specificity and Intrinsic Vulnerability do not count towards meeting the minimum factors requirement.
If not met, a GU (or SU) rank is returned.

Overrides:
Any factor = exact Z produces GX (or SX). (Population size, Area of Occupancy, # of Occurrences, or Range Extent)
(An exact Z for one factor with non-Z values for other rarity factors produces an error (rank will = "Z-ERROR").)
Any factor = Z range produces GH (or SH). (Population size, Area of Occupancy, # of Occurrences, or Range Extent)
Population size or Area of Occupancy = A, AB, B, ZA, or ZB produces G1 (or S1).

Ruleset:
Ruleset Name: Standard with "Trend Subtraction/Addition Method"
Point scale: Linear scale
Point range: 5.50
Averaging method: 3AVG
Rarity weight: 0.7
Threats weight: 0.3
Trends weight: 0

Factor weights:

<table>
<thead>
<tr>
<th>Rarity</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Range Extent</td>
<td>1</td>
</tr>
<tr>
<td>Area of Occupancy</td>
<td>2</td>
</tr>
<tr>
<td># of Occurrences</td>
<td>1</td>
</tr>
<tr>
<td>Population Size</td>
<td>2</td>
</tr>
<tr>
<td># of Occurrences with Good Viability/Ecological Integrity</td>
<td>2</td>
</tr>
<tr>
<td>Percent Area with Good Viability/Ecological Integrity</td>
<td>2</td>
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</table>

*Environmental Specificity 1

<table>
<thead>
<tr>
<th>Threats</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Overall Threat Impact</td>
<td>1</td>
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<tr>
<td>*Intrinsic Vulnerability</td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Trends</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Short-term Trend</td>
<td>2</td>
</tr>
<tr>
<td>Long-term Trend</td>
<td>1</td>
</tr>
</tbody>
</table>

*Intrinsic Vulnerability only if Overall Threat Impact is unknown or null

Thresholds:

| Range Rank Upper | 95% |
| Range Rank Lower | 80% |
These summaries are for a quick reminder; they do not contain all the information necessary for ranking. Please carefully review "NatureServe Conservation Status Assessment: Factors for Evaluating Species and Ecosystem Risk" (Master et al. 2012).

**RARITY - Range/Distribution FACTOR GROUP**

<table>
<thead>
<tr>
<th>Code</th>
<th>Range Extent (weight = 1)</th>
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</thead>
<tbody>
<tr>
<td>Z</td>
<td>Zero (no occurrences believed extant; presumed extinct)</td>
</tr>
<tr>
<td>A</td>
<td>&lt;100 square km (&lt; about 40 square mi)</td>
</tr>
<tr>
<td>0.79 B</td>
<td>100-250 square km (about 40-100 square mi)</td>
</tr>
<tr>
<td>1.57 C</td>
<td>250-1,000 square km (about 100-400 square mi)</td>
</tr>
<tr>
<td>2.36 D</td>
<td>1,000-5,000 square km (about 400-2,000 square mi)</td>
</tr>
<tr>
<td>3.14 E</td>
<td>5,000-20,000 square km (about 2,000-8,000 square mi)</td>
</tr>
<tr>
<td>3.93 F</td>
<td>20,000-200,000 square km (about 8,000-80,000 square mi)</td>
</tr>
<tr>
<td>4.71 G</td>
<td>200,000-2,500,000 square km (about 80,000-1,000,000 square mi)</td>
</tr>
<tr>
<td>5.50 H</td>
<td>&gt;2,500,000 square km (&gt; 1,000,000 square mi)</td>
</tr>
<tr>
<td>U</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**Environmental Specificity**

<table>
<thead>
<tr>
<th>Points</th>
<th>Only used if # of Occurrences &amp; Area of Occupancy are Unknown or Null. (weight = 1)</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>A = Very narrow. Specialist or ecosystem with key requirements scarce</td>
</tr>
<tr>
<td>1.83 B</td>
<td>B = Narrow. Specialist or ecosystem with key requirements common</td>
</tr>
<tr>
<td>3.67 C</td>
<td>C = Moderate. Generalist or ecosystem with some key requirements scarce</td>
</tr>
<tr>
<td>5.50 D</td>
<td>D = Broad. Generalist or ecosystem with all key requirements common</td>
</tr>
<tr>
<td>U</td>
<td>U = Unknown</td>
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</tbody>
</table>

**Area of Occupancy (AOO) (weight = 2)**

<table>
<thead>
<tr>
<th>Code</th>
<th>ECOCLOGICAL UNIT S (km2)</th>
<th>SPECIES (grid cell count)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Default/L. Patch</td>
<td>Small Patch</td>
</tr>
<tr>
<td>Z</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A</td>
<td>&lt;1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>0.69 B</td>
<td>1-5</td>
<td>0.1-0.5</td>
</tr>
<tr>
<td>1.38 C</td>
<td>5-10</td>
<td>0.5-1</td>
</tr>
<tr>
<td>2.06 D</td>
<td>10-20</td>
<td>1-2</td>
</tr>
<tr>
<td>2.75 E</td>
<td>20-100</td>
<td>2-5</td>
</tr>
<tr>
<td>3.44 F</td>
<td>100-500</td>
<td>5-20</td>
</tr>
<tr>
<td>4.13 G</td>
<td>500-2,000</td>
<td>20-100</td>
</tr>
<tr>
<td>4.81 H</td>
<td>2,000-20,000</td>
<td>100-500</td>
</tr>
<tr>
<td>5.50 I</td>
<td>&gt;20,000</td>
<td>&gt;500</td>
</tr>
</tbody>
</table>

**RARITY - Abundance/Condition FACTOR GROUP**

<table>
<thead>
<tr>
<th>Code</th>
<th>Number of Occurrences (weight = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>Zero (zero; presumed extinct)</td>
</tr>
<tr>
<td>A</td>
<td>1 - 5 individuals</td>
</tr>
<tr>
<td>0.79 B</td>
<td>1 - 50 individuals</td>
</tr>
<tr>
<td>1.57 C</td>
<td>1 - 250 individuals</td>
</tr>
<tr>
<td>2.36 D</td>
<td>1 - 1,000 individuals</td>
</tr>
<tr>
<td>3.14 E</td>
<td>1 - 2,500 individuals</td>
</tr>
<tr>
<td>3.93 F</td>
<td>1 - 10,000 individuals</td>
</tr>
<tr>
<td>4.71 G</td>
<td>1 - 100,000 individuals</td>
</tr>
<tr>
<td>5.50 H</td>
<td>1 - 1,000,000 individuals</td>
</tr>
<tr>
<td>U</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**Population Size (weight = 2)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Ecosystem size (A = 1 - 250 individuals; B = 250 - 1,000 individuals; C = 1,000 - 5,000 individuals; D = 5,000 - 20,000 individuals; E = 20,000 - 100,000 individuals; F = 100,000 - 1,000,000 individuals; G = &gt;1,000,000 individuals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Z = Zero, no individuals believed extant (presumed extinct)</td>
</tr>
<tr>
<td>0.79 B</td>
<td>B = 50 - 250,000 individuals</td>
</tr>
<tr>
<td>1.57 C</td>
<td>C = 250 - 1,000,000 individuals</td>
</tr>
<tr>
<td>2.36 D</td>
<td>D = 1,000 - 5,000,000 individuals</td>
</tr>
<tr>
<td>3.14 E</td>
<td>E = 5,000 - 20,000,000 individuals</td>
</tr>
<tr>
<td>3.93 F</td>
<td>F = 20,000 - 100,000,000 individuals</td>
</tr>
<tr>
<td>4.71 G</td>
<td>G = 100,000 - 1,000,000,000 individuals</td>
</tr>
<tr>
<td>5.50 H</td>
<td>H = &gt;1,000,000,000 individuals</td>
</tr>
<tr>
<td>U</td>
<td>U = Unknown</td>
</tr>
</tbody>
</table>

**Number of Occurrences with Good Viability/Ecological Integrity**

<table>
<thead>
<tr>
<th>Code</th>
<th>Number of Occurrences with Good Viability/Ecological Integrity (weight = 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No occurrences with excellent or good (A or B) viability or ecological integrity</td>
</tr>
<tr>
<td>1.10 B</td>
<td>Very few (1-3) occurrences with excellent or good viability or ecological integrity</td>
</tr>
<tr>
<td>2.20 C</td>
<td>Few (4-12) occurrences with excellent or good viability or ecological integrity</td>
</tr>
<tr>
<td>3.30 D</td>
<td>Some (13-40) occurrences with excellent or good viability or ecological integrity</td>
</tr>
<tr>
<td>4.40 E</td>
<td>Many (41-125) occurrences with excellent or good viability or ecological integrity</td>
</tr>
<tr>
<td>5.50 F</td>
<td>Very many (&gt;125) occurrences with excellent or good viability or ecological integrity</td>
</tr>
<tr>
<td>U</td>
<td>U = Unknown</td>
</tr>
</tbody>
</table>

**Percent Area Occupied with Good Viability/Ecological Integrity**

<table>
<thead>
<tr>
<th>Points</th>
<th>Percent Area Occupied with Good Viability/Ecological Integrity (weight = 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No area with excellent or good (A or B) viability or ecological integrity</td>
</tr>
<tr>
<td>1.10 B</td>
<td>Very small percentage (&lt;5%) of area with excellent or good viability/integrity</td>
</tr>
<tr>
<td>2.20 C</td>
<td>Small percentage (5-10%) of area with excellent or good viability/integrity</td>
</tr>
<tr>
<td>3.30 D</td>
<td>Moderate percentage (11-20%) of area with excellent or good viability/integrity</td>
</tr>
<tr>
<td>4.40 E</td>
<td>Good percentage (21-40%) of area with excellent or good viability/integrity</td>
</tr>
<tr>
<td>5.50 F</td>
<td>Excellent percentage (&gt;40%) of area with excellent or good viability/integrity</td>
</tr>
<tr>
<td>U</td>
<td>U = Unknown</td>
</tr>
</tbody>
</table>

Enter this OR Percent Area Occupied with Good Viability/Ecological Integrity; if both filled out, the more restrictive of the two values will be used.

Must also fill out Area of Occupancy.
### Threats and Trends Factor Group

**Pts Overall Threat Impact (weight = 1)**
- 0 A = Very High
- 1.83 B = High
- 3.67 C = Medium
- 5.50 D = Low
- U = Unknown

**Threat Scope** (Typically assessed within a 10-year timeframe for taxa or 20-year timeframe for ecosystems)
- **Pervasive** = Affects all or most (71-100%) of the total population or occurrences
- **Large** = Affects much (31-70%) of the total population or occurrences
- **Restricted** = Affects some (11-30%) of the total population or occurrences
- **Small** = Affects a small proportion (1-10%) of the total population or occurrences
- **Negligible** = Affects a negligible proportion (<1%) of total population or occurrences
- **Unknown**

**Threat Impact Calculation**

<table>
<thead>
<tr>
<th>Severity</th>
<th>Pervasive</th>
<th>Large</th>
<th>Restricted</th>
<th>Small</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme</td>
<td>Very High</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Serious</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Moderate</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Slight</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Unknown</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Intrinsic Vulnerability**
- Pts Only used if Overall Threat is Unknown or Null (weight = 1)
- 0 A = Highly vulnerable
- 2.75 B = Moderately vulnerable
- 5.50 C = Not intrinsically vulnerable

**Pts Short-term Trend (10 years or 3 generations (up to 100 yrs.) for taxa or 50 years for ecosystems**
- -0.50 A = Decline of >90%
- -0.40 B = Decline of 80 - 90%
- -0.31 C = Decline of 70 - 80%
- -0.22 D = Decline of 50 - 70%
- -0.14 E = Decline of 30 - 50%
- -0.07 F = Decline of 10 - 30%
- 0 G = Relatively Stable (<=10% change)
- 0.07 H = Increase of 10 - 25%
- 0.14 I = Increase of >25%
- U = Unknown

**Threat Timing**
- Not used in calculating Threat Impact, except Insig./Negligible results in no impact.
- **High** = Continuing
- **Moderate** = In the short-term future, or now suspended but could return in short term
- **Low** = In the long-term future, or now suspended but could return in long term
- **Insignificant/Negligible** = Only in past & unlikely to return, or no direct affect but limiting

**Pts Long-term Trend (over the past ca. 200 years)**
- -0.50 A = Decline of >90%
- -0.40 B = Decline of 80 - 90%
- -0.31 C = Decline of 70 - 80%
- -0.22 D = Decline of 50 - 70%
- -0.14 E = Decline of 30 - 50%
- -0.07 F = Decline of 10 - 30%
- 0 G = Relatively Stable (<=10% change)
- 0.07 H = Increase of 10 - 25%
- 0.14 I = Increase of >25%
- U = Unknown
**Threats Assessment Instructions**

The IUCN-CMP Unified Classification of Direct Threats (Salafsky et al. 2008) is a hierarchical classification with 2 main levels of threats. Version 2.3 Level1-2 threats are listed on the Threats Assessment sheet. The level-1 threats are highlighted in tan because they are most important: you must manually roll up all scope and severity scores to Level 1 and only level-1 threats are included in the Overall Threat calculation.

*For more information about the threats classification, see [http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme](http://www.iucnredlist.org/technical-documents/classification-schemes/threats-classification-scheme).*

"Threats Assessment" sheet is for recording threats and calculating/assigning an Overall Threat Impact score for use in conservation rank calculation (Calculator Form rows 29-30).

"Threats Data Compiled" sheet is for storing threat data for multiple elements. It is not intended for data entry; it is only populated using the "Copy Data to Threats Data Compiled" button on the Threats Assessment sheet or with an export from Biotics. Do not click the copy button until you have finalized the threats assessment for an element.

**How to use the Threats Assessment Worksheet**

Note: If, using your best professional judgment, you think the overall Threat Impact is Low, you may scan the table to be sure you haven’t missed anything, but then proceed directly to recording the Assigned Overall Threat Impact.

1. Record an estimate of the scope, severity, and timing for applicable threats to the species or ecosystem. (See Factors Reference sheet for ratings.)
2. The impact of each threat is automatically calculated from the scope and severity values (Table 10 below).
3. Roll up all level-2 threat scope and severity scores to level-1. Roll up using these guidelines:
   a) If there is only one level-2 threat recorded within the level-1 threat, assign the level-2 scope, severity, and timing values to the level-1 threat.
   b) If there are multiple level 2-threats recorded within the level-1 threat, evaluate their degree of overlap:
      - if the level-2 threats overlap, assign the scope and severity values of the highest impact level-2 threat;
      - if the level-2 threats are substantially non-overlapping, then best professional judgment should be used to assign scope, severity, and timing values; higher scope and severity values may be justified.
4. After scope and severity have been recorded for all applicable level-1 threats, check the automatic calculation of overall threat impact (see Table 12 below). The impact value counts are displayed in the 'Overall Threat Impact Calculation Help' table*. The Calculated Overall Threat Impact value should be reviewed and, using best professional judgment, adjusted if needed before it is entered as the Assigned Overall Threat Impact. Whether or not you adjust the Calculated Overall Threat Impact, you *must* fill in "Assigned Overall Threat Impact" using the dropdown box. If you do adjust the calculated impact, you should fill out the "Overall Threat Impact Adjustment Reasons" field.

5. Click the "Copy Overall Impact and Adjustments Reasons to Calculator" button to copy your final values to the Calculator Form. The Calculated Overall Threat Impact is automatically displayed on the Calculator Form.
6. Fill out Overall Threat Impact Comments in the Calculator Form (cell H29).
7. If desired, save your threats data using the "Copy Data to Threats Data Compiled" button on the Threats Assessment sheet.

*Uncertainty Ranges: Please avoid using uncertainty ranges if at all possible! If the value for one or more level 1 impacts is a range, evaluate the highest (single and range) values for every level 1 threat and then evaluate the lowest values to determine the range of overall threat impact. For example, three Medium-Low impacts indicates an overall threat impact of High-Low, and four Medium-Low impacts indicates an overall threat impact of High-Medium. (This is done in the 2 columns in the 'Overall Threat Impact Calculation Help' table.)*

**Table 12. Guidelines for assigning overall impact value** (from Master et al. 2012)

<table>
<thead>
<tr>
<th>Impact Values of Level 1 Threat Categories</th>
<th>Overall Threat Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥1 Very High, OR</td>
<td>Very High</td>
</tr>
<tr>
<td>≥2 High, OR</td>
<td></td>
</tr>
<tr>
<td>1 High + ≥2 Medium</td>
<td></td>
</tr>
<tr>
<td>1 High, OR</td>
<td>High</td>
</tr>
<tr>
<td>≥3 Medium, OR</td>
<td></td>
</tr>
<tr>
<td>2 Medium + 2 Low, OR</td>
<td></td>
</tr>
<tr>
<td>1 Medium + ≥3 Low</td>
<td></td>
</tr>
<tr>
<td>1 Medium, OR</td>
<td>Medium</td>
</tr>
<tr>
<td>≥4 Low</td>
<td></td>
</tr>
<tr>
<td>1-3 Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Table 10. Calculation of threat impact**

(from Master et al. 2012)

<table>
<thead>
<tr>
<th>Threat Impact Calculation</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pervasive</td>
</tr>
<tr>
<td></td>
<td>Extreme</td>
</tr>
<tr>
<td></td>
<td>Serious</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td>Slight</td>
</tr>
</tbody>
</table>
### EGR B5 export for Calculator Table

This query returns global rank data from Biotics5 for import into the Calculator Table. 

**REMEMBER TO CHANGE WORKING LIST (or ELEMENT_GLOBAL_IDs) AT END OF QUERY**

<table>
<thead>
<tr>
<th>SELECT</th>
<th>SELECT</th>
<th>SELECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>eg.g_rank assigned_rank</td>
<td>sn.scientific_name</td>
<td>gname</td>
</tr>
<tr>
<td>sn.scientific_name</td>
<td>es.s_rank assigned_rank</td>
<td>sname</td>
</tr>
<tr>
<td>gname</td>
<td>eg.element_global_id</td>
<td>name_level</td>
</tr>
<tr>
<td>gname</td>
<td>eg.elcode_bcd</td>
<td>lower(dcl.classification_level_keyword)</td>
</tr>
<tr>
<td>gname</td>
<td>case when sn.d_classification_level_id in (7,17) then 'Species' when sn.d_classification_level_id</td>
<td>name_level</td>
</tr>
<tr>
<td>gname</td>
<td>eg.element_global_id</td>
<td>dpat.ranking_spatial_pattern_desc</td>
</tr>
<tr>
<td>gname</td>
<td>eg.element_global_id</td>
<td>dtic.threat_impact_calc_cd</td>
</tr>
<tr>
<td>gname</td>
<td>eg.element_global_id</td>
<td>dtia.threat_impact_assigned_cd</td>
</tr>
<tr>
<td>gname</td>
<td>eg.element_global_id</td>
<td>egr.g_impact_adjustment_reasons</td>
</tr>
<tr>
<td>gname</td>
<td>eg.element_global_id</td>
<td>egr.g_primary_common_name</td>
</tr>
<tr>
<td>gname</td>
<td>es.element_subnational_id</td>
<td>dtc.iucn_threat_category_cd</td>
</tr>
<tr>
<td>gname</td>
<td>dtc.iucn_threat_category_desc</td>
<td>NULL</td>
</tr>
<tr>
<td>gname</td>
<td>n nation</td>
<td>s.subnation_code subnation</td>
</tr>
<tr>
<td>gname</td>
<td>NVL(daood.aoo_direct_default_cd, NVL(daoom.aoo_direct_matrix_cd, daoos.aoo_direct_sm)</td>
<td>drange.range_extent_cd</td>
</tr>
<tr>
<td>gname</td>
<td>daoo4.AOO_4KM_CD aoo_4km_cd</td>
<td>dtt.display_value timing_cd</td>
</tr>
<tr>
<td>gname</td>
<td>daoo1.AOO_1KM_CD aoo_1km_cd</td>
<td>ta.g_iucn_threat_comments</td>
</tr>
<tr>
<td>gname</td>
<td>deos.number_eos_cd</td>
<td>el_GLOBAL_THREATS_ASSESS ta</td>
</tr>
<tr>
<td>gname</td>
<td>dpop.pop_size_cd</td>
<td>element_global eg</td>
</tr>
<tr>
<td>gname</td>
<td>dngood.number_good_eos_cd</td>
<td>egr.element_global_id</td>
</tr>
<tr>
<td>gname</td>
<td>dpgood.aoo_percent_good_cd</td>
<td>eg.element_global_id</td>
</tr>
<tr>
<td>gname</td>
<td>denviro.enviro_specificity_cd</td>
<td>dshort.short_term_trend_cd</td>
</tr>
<tr>
<td>gname</td>
<td>dthreata.threat_impact_assigned_cd</td>
<td>dlong.long_term_trend_cd</td>
</tr>
<tr>
<td>gname</td>
<td>dthreatc.threat_impact_calc_cd</td>
<td>dintrin.intrin_vulnerability_cd</td>
</tr>
<tr>
<td>gname</td>
<td>dintrin.intrin_vulnerability_cd</td>
<td>d_threat_impact_calc dtic</td>
</tr>
<tr>
<td>gname</td>
<td>dshort.short_term_trend_cd</td>
<td>d_threat_impact_assigned dtia</td>
</tr>
<tr>
<td>gname</td>
<td>dlong.long_term_trend_cd</td>
<td>d_threat_impact_calc dtic</td>
</tr>
<tr>
<td>gname</td>
<td>Reasons and Version */</td>
<td>d_threat_impact_assigned dtia</td>
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<tr>
<td>gname</td>
<td>Reasons and Version */</td>
<td>d_threat_impact_calc dtic</td>
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<td>Reasons and Version */</td>
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<td>d_threat_impact_calc dtic</td>
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<tr>
<td>gname</td>
<td>Reasons and Version */</td>
<td>Reasons and Version */</td>
</tr>
</tbody>
</table>

** CAUTION: If you are planning to make updates to your exported data, make sure you have a plan for tracking these edits and pasting them back into Biotics. We strongly discourage the use of an import for data updates. (See Import into Biotics tab.)**
and eg.gname_id = sn.scientific_name_id
and eg.gname_id = sn.scientific_name_id
and ta.element_global_id = egr.element_global_id (+)
and ta.d_iucn_threat_category_id = dtc.d_iucn_threat_category_id
and eg.d_threat_impact_assigned_id = dta.d_threat_impact_assigned_id (+)
and eg.d_threat_impact_calc_id = dta.d_threat_impact_calc_id (+)
and ta.d_iucn_threat_scope_id = dtsc.d_iucn_threat_scope_id (+)
and ta.d_iucn_threat_severity_id = dtse.d_iucn_threat_severity_id (+)
and ta.d_iucn_threat_timing_id = dttt.d_iucn_threat_timing_id (+)
and dtc.IUCN_THREAT = 'Y' /* LIMIT TO IUCN THREATS */
and eg.inactive_ind = 'N' /* EXCLUDE INACTIVES */
and eg.element_global_id in (select wled.data_id
from working_list_element_data wled, working_list wl
where wled.working_list_id = wl.working_list_id
and wl.working_list_name = 'ENTER WORKING LIST NAME HERE')

/* CHANGE WORKING LIST NAME /**/
(SELECT wled.data_id FROM working_list_element_data wled, working_list wl
WHERE wled.working_list_id = wl.working_list_id
AND wl.working_list_name = 'ENTER WORKING LIST NAME HERE') /*
** TO USE IDs INSTEAD OF WORKING LIST (for advanced users):
Update and uncomment this element_global_id list and remove the working list section.***/

ORDER BY
sn.scientific_name, dtc.display_order

WHERE
eg.gname_id = sn.scientific_name_id
and eg.element_global_id = egr.element_global_id (+)
and es.name_id = sn.scientific_name_id
and eg.element_global_id = egr.element_global_id (+)
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)

and eg.gname_id = sn.scientific_name_id
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)

and eg.gname_id = sn.scientific_name_id
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)

and eg.gname_id = sn.scientific_name_id
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)

and eg.gname_id = sn.scientific_name_id
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)

and eg.gname_id = sn.scientific_name_id
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)

and eg.gname_id = sn.scientific_name_id
and es.name_id = sn.scientific_name_id
and sn.d_name_category_id = dnc.d_name_category_id
and sn.d_classification_level_id = dcl.d_classification_level_id
and sn.d_intrin_vulnerability_id = dintrin.d_intrin_vulnerability_id (+)
### Export Data from Biotics4 (pre-2011 Data Model) into the Calculator Table

*(See previous tab for export from 2011 Data Model Biotics Design in Biotics5.)*

#### Instructions:
1. Paste one of the following queries (global (column A) or subnational (column C), row 13 down) into Biotics Query Builder.
   
   2. **YOU MUST CHANGE RECORD SELECTION AT END OF QUERY**
      - a. To select by working list, CHANGE THE WORKING LIST NAME.
      - b. To select by element_global_id (or element_subnational_id), CHANGE THE ID list AND REMOVE THE WORKING LIST SECTION.

3. Paste the results into the Calculator Table starting in the first empty row in **column B**.

   Your results will be truncated if you have more than 1189 records; this is to ensure that your results don’t paste below row 1193 (red line).

   **CAUTION:** If you are planning to make updates to your exported data, make sure you have a plan for tracking these edits and pasting them back into Biotics.

   We strongly discourage the use of an import for data updates. *(See next tab.)*

---

#### EGR_PRE2011_for_Calculator_Table.qry

This query returns global rank data (pre-2011 model) for import into the Calculator Table.

**NOTE:** AOO, Linear Occupancy, short-term trend, long-term trend, and overall threat are converted to the new scale. (Linear Occupancy is only used if AOO is blank or U.)

**REMEMBER TO CHANGE ELEMENT_GLOBAL_IDs AND WORKING LIST AT END OF QUERY*******/

```sql
SELECT
  egt.g_rank,
  sn.scientific_name gname,
  lower(d_classification_level.classification_level_keyword) name_level,
  NULL spatial_pattern,
  egt.element_global_id glob_id,
  egt.elcode_bcd,
  egt.g_primary_common_name,
  d_name_category.name_category_desc name_categ,
  NULL nation,
  /* Rank Factors */
  d_range_extent.RANGE_EXTENT_CD RANGE_EXTENT,
```

---

#### ESR_PRE2011_for_Calculator_Table.qry

This query returns subnational rank data (pre-2011 model) for import into the Calculator Table.

**NOTE:** AOO, Linear Occupancy, short-term trend, long-term trend, and overall threat are converted to the new scale. (Linear Occupancy is only used if AOO is blank or U.)

**REMEMBER TO CHANGE ELEMENT_SUBNATIONAL_IDs AND WORKING LIST AT END OF QUERY*******/

```sql
SELECT
  est.s_rank,
  sn.scientific_name sname,
  lower(d_classification_level.classification_level_keyword) name_level,
  NULL spatial_pattern,
  est.element_subnational_id subntl_id,
  est.elcode_bcd,
  est.s_primary_common_name,
  d_name_category.name_category_desc name_categ,
  s.subnation_code subnation,
  /* Rank Factors */
  d_range_extent.RANGE_EXTENT_CD RANGE_EXTENT,
```
CASE WHEN d_area_of_occupancy.AREA_OF_OCCUPANCY_CD is null
    or (d_area_of_occupancy.AREA_OF_OCCUPANCY_CD = 'U'
        and d_lin_dist_of_occupancy.LIN_DIST_OF_OCCUPANCY_CD != 'U')
    THEN DECODE(d_lin_dist_of_occupancy.LIN_DIST_OF_OCCUPANCY_CD,
        'A', 'A',
        'AB', 'AB',
        'AC', 'AD',
        'AD', 'AE',
        'AE', 'AF',
        'AF', 'AG',
        'AG', 'AH',
        'AH', 'AI',
        'B', 'AB',
        'BC', 'BD',
        'BD', 'BE',
        'BE', 'BF',
        'BF', 'BG',
d_number_eos.NUMBER_EOS_CD NUM_EOS,
    (case when d_name_category.name_type_cd in ('P', 'A') then d_pop_size.POP_SIZE_CD else '' end)
    POP_SIZE,
    d_number_good_eos.NUMBER_GOOD_EOS_CD NUM_GOOD_EOS,
    NULL Prop_Area_Good,
    d_enviro_specificity.ENVIRO_SPECIFICITY_CD ENVIRO_SPECIFICITY,
    DECODE (d_threat.THRAT_CD,
            'A', 'AB',
            'AB', 'AC',
            'AC', 'AC',
            'AD', 'AC',
            'AE', 'AC',
            'AF', 'AC',
            'AG', 'AD',
            'Z', 'Z',
            'ZA', 'ZA',
            'ZB', 'ZB',
            'ZC', 'ZD',
            'ZD', 'ZE',
            'ZE', 'ZF',
            'ZF', 'ZG',
            'ZG', 'ZH',
            'ZH', 'Z',
    ) END LINEAR_OCCUP_KM_CONVERTED,
    d_number_eos.NUMBER_EOS_CD NUM_EOS,
    (case when d_name_category.name_type_cd in ('P', 'A') then d_pop_size.POP_SIZE_CD else '' end)
    POP_SIZE,
    d_number_good_eos.NUMBER_GOOD_EOS_CD NUM_GOOD_EOS,
    NULL Prop_Area_Good,
    d_enviro_specificity.ENVIRO_SPECIFICITY_CD ENVIRO_SPECIFICITY,
DECODE (d_long_term_trend.LONG_TERM_TREND_CD,
' A', ' A', 
' AB', ' AC', 
' AC', ' AD', 
' AD', ' AE', 
' AE', ' AH', 
' AF', ' U', 
' B', ' BC', 
' BC', ' BD', 
' BD', ' BE', 
' BE', ' BH', 
' BF', ' BI', 
' C', ' D', 
' CD', ' DE', 
' CE', ' DH', 
' CF', ' CI', 
' D', ' E', 
' DE', ' EH', 
' DF', ' DI', 
' E', ' FH', 
' EF', ' FI', 
' F', ' I', 
' U', ' U', 
') SHORT_T_TR_CONVERTED,
/* Comments Fields */
 NULL Adjust_Reasons,
 egr.G_RANK_REASONS,
 egr.VERSION_AUTHOR,
 egr.VERSION_DATE,
 NULL rank_assign_author,
 egt.g_rank_review_date,
 egr.INTERNAL_NOTES,
 egr.G_RANGE_COM,
 egr.G_AREA_DIST_OF_OCCUPANCY_COM,
 egr.G_NUMBER_EOS_COM,
 egr.G_POP_SIZE_COM,
 egr.G_NUMBER_GOOD_EOS_COM,
 egr.G_ENVIRO_SPECIFICITY_COM,
 egr.G_THREAT_COM,

DECODE (d_long_term_trend.LONG_TERM_TREND_CD,
' A', ' A', 
' AB', ' AC', 
' AC', ' AD', 
' AD', ' AE', 
' AE', ' AH', 
' AF', ' U', 
' B', ' BC', 
' BC', ' BD', 
' BD', ' BE', 
' BE', ' BH', 
' BF', ' BI', 
' C', ' D', 
' CD', ' DE', 
' CE', ' DH', 
' CF', ' CI', 
' D', ' E', 
' DE', ' EH', 
' DF', ' DI', 
' E', ' FH', 
' EF', ' FI', 
' F', ' I', 
' U', ' U', 
') SHORT_T_TR_CONVERTED,
NULL impact_adjustment_reasons,
egr.G_INTRINSIC_VULNERABILITY_COM,
egr.G_SHORT_TERM_TREND_COM,
egr.G_LONG_TERM_TREND_COM

FROM

element_global egt,

element_global_rank egr,
scientific_name sn,

d_classification_level,
d_name_category,
d_number_eos,
d_number_good_eos,
d_number_prot_eos,
d_pop_size,
d_range_extent,
d_area_of_occupancy,
d_lin_dist_of_occupancy,
d_long_term_trend,
d_short_term_trend,
d_threat,
d_intrin_vulnerability,
d_enviro_specificity

WHERE

egt.element_global_id = egr.element_global_id (+)
and egt.gname_id = sn.scientific_name_id

and sn.d_classification_level_id = d_classification_level.d_classification_level_id
and sn.d_name_category_id = d_name_category.d_name_category_id
and egr.d_number_eos_id = d_number_eos.d_number_eos_id (+)
and egr.d_number_good_eos_id = d_number_good_eos.d_number_good_eos_id (+)
and egr.d_number_prot_eos_id = d_number_prot_eos.d_number_prot_eos_id (+)
and egr.d_pop_size_id = d_pop_size.d_pop_size_id (+)
and egr.d_range_extent_id = d_range_extent.d_range_extent_id (+)
and egr.d_long_term_trend_id = d_long_term_trend.d_long_term_trend_id (+)
and egr.d_short_term_trend_id = d_short_term_trend.d_short_term_trend_id (+)
and egr.d_threat_id = d_threat.d_threat_id (+)
and egr.d_intrin_vulnerability_id = d_intrin_vulnerability.d_intrin_vulnerability_id (+)
and egr.d_enviro_specificity_id = d_enviro_specificity.d_enviro_specificity_id (+)
and egt.inactive_ind = 'N' /* EXCLUDE INACTIVES */
and egt.element_global_id in

/***CHANGE WORKING LIST NAME/***
\[ \text{select wled.data_id from working_list_element_data wled, working_list wl where wled.working_list_id = wl.working_list_id and wl.working_list_name = 'ENTER WORKING LIST NAME HERE'} \]

and rownum < 1190 /* Limit to 1189 results so fits in calculator */
ORDER BY
d_name_category.d_name_category_id,
sn.scientific_name

\[ \text{select wled.data_id from working_list_element_data wled, working_list wl where wled.working_list_id = wl.working_list_id and wl.working_list_name = 'ENTER WORKING LIST NAME HERE'} \]

and rownum < 1190 /* Limit to 1189 results so fits in calculator */
ORDER BY
d_name_category.d_name_category_id,
sn.scientific_name
You cannot import data into the old 2002 Methodology Biotics Design.

There is currently no process for importing rank calculator data into Biotics. The process that was being developed for Biotics4 cannot be used in Biotics5 because Exchanger does not work with Biotics5. The temporary solution is to create an SQL upload process, but that has not been completed. If you would like to assist with development or testing, contact kristin_snow@natureserve.org. (Unfortunately we cannot provide funding for your time.)

In the meantime, you are welcome to try your own SQL import into Biotics5 using the guidelines below, but please consider the following cautions. If you need help, please submit a Biotics Help Ticket.

**CAUTION:** You should not attempt import rank calculator data into Biotics4; the data models do not match. Only import into Biotics5.

**CAUTION:** The calculator does not include reference fields and other supporting fields that are necessary for a complete record in Biotics5. You will need to add those data.

**CAUTION:** If you are making updates to elements that already have ranking data in Biotics, we strongly encourage you to use copy-and-paste instead of an import. An import will not record audit tracking, could accidentally overwrite data you wanted to keep, and could overwrite any edits another user may have made since you downloaded the data.

**CAUTION:** Do not do this without confidence that you know what you're doing (or help).

### Guidelines for importing Calculator Table data into Biotics using SQL

1. Make sure that the same taxon or community is listed only once in the Calculator Table.
2. Make sure that each taxon or community in the Calculator Table has an element_global record in Biotics; for NRanks and SRanks, each taxon or community also needs an element_national or element_subnational record, respectively. Ensure that the correct element_global_id, element_national_id, or element_subnational_id is entered in the Calculator Table.
3. For each taxon or community in the Calculator Table, check for the existence of a record in element_global_rank (for GRanks), element_national_rank (NRanks), or element_subnational_rank (SRanks).
   -- If a record does not exist, you will need to write an INSERT statement for the taxon or community.
   -- If a record does exist, you will first need to ensure there are not data you don't want to overwrite, and then write an UPDATE statement for the taxon or community. (We strongly discourage this; see above.)

   The letter values for the rank factors need to be converted to IDs, either beforehand or within the Insert or Update statement.

   Assistance can be provided in converting the tabular data to these statements.
4. Once the data are imported, go through each record in Tracker to check the results and to enter data in supporting fields.
Converting your data from version 2.0r2 to version 3.1
You cannot copy Calculator Table data directly from a version 2 rank estimator to version 3.1, due to new fields and changes in field order. Instead, download the file "convert to v3.xlsx" and follow the instructions.

Changes to Element Rank Estimator Simplified since v2.0r2 (2009)
See also the Preface to Master et al. 2012.

<table>
<thead>
<tr>
<th>worksheet</th>
<th>change</th>
<th>affects rank?</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Upgraded to Excel 2007</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added automatic turn off of Excel drag-and-drop, which causes errors in the Calculator Table</td>
<td>N</td>
</tr>
<tr>
<td>Calculator Form</td>
<td>Changed Trends calculation to use the &quot;Trend Subtraction/Addition Method&quot; (see &quot;Implementing the Status Assessment Method&quot; in Faber-Langendoen et al. 2012)</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>For ecosystems, added a spatial pattern field that changes the Area Occupied scale</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Added a field for recording Subnation or Nation</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added Overall Threat Impact Adjustment Reasons field plus a read-only field for Calculated Overall Threat Impact (from Threats Assessment worksheet)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Replaced fields Rank Author and Rank Date with 4 fields: Rank Factors Author, Rank Factors Date, Rank Assign Author, and Rank Review Date. The 4 fields correspond to the following Biotics fields, respectively: version_author, version_date, rank_assignment_author (new field), g_rank_review_date.</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Changed the order of Trends and Threats</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added requirement that scientific name be filled out for Copy Data to Calculator Table</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>In the Percent of Area Occupied with Good Viability/Ecological Integrity dropdown, fixed the description of 2 range values: BF and DF (which was incorrectly labeled BE)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>In the Population Size dropdown, fixed the definition for BF (which was incorrectly labeled DF)</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added guidelines for when to leave Population Size blank</td>
<td>N</td>
</tr>
<tr>
<td>Calculator Table</td>
<td>Added option to clear the Threats Assessment worksheet when loading data into the Calculator Form.</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Improved Copy to Form error messages</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added fields and changed field order to match changes listed under Calculator Form. These changes mean that extra steps must be taken to import version 2 data into version 3.1. (Download the file &quot;convert to v3.xlsx&quot; to do so.)</td>
<td>N</td>
</tr>
<tr>
<td>Threats Assessment</td>
<td>Fixed calculation of Threat Impact for 2 scope-severity combinations: Scope = Restricted-Small + Severity = Moderate (Impact should be D not CD), and Scope = Restricted + Severity = Moderate-Slight (Impact should be D, not CD).</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Changed Threat Impact calculation so that if Timing is scored as Low, Insignificant/Negligible, or Unknown, a Threat Impact is not calculated (appears as &quot;Not in timeframe&quot;), as threats are assessed within the next 10 years or 3 generations for taxa or 20 years for ecosystems.</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Added &quot;No known threats&quot; and &quot;Unknown/Undetermined&quot; choices</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added a warning and highlighting that appear if threat data have been entered but insufficient to calculate Impact for the Level 1 threat</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added hyperlinks from threats to their descriptions on the CMP website</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Added more information to the scope and severity dropdowns and headings and moved instructions onto a new sheet</td>
<td>N</td>
</tr>
<tr>
<td>Added “Negligible” options to the scope and severity dropdowns and “Neutral or Potential Benefit” to the severity dropdown. While the Threats Assessment is not intended to be used as a laundry list of threats, a Negligible option prevents the problem of potential threats being scored as Low when they really are negligible.</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Changed display of Threat Impact such that a reason is displayed if Impact is not calculated</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Added Calculated Overall Threats Impact to Threats sheets, Calculator Forms, and Tabular Calculator, so it’s available for upload to Biotics</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Threats Data</td>
<td>Added a Copy to Threats Assessment button and Cautions</td>
<td>N</td>
</tr>
<tr>
<td>Biotics Export/Import</td>
<td>Modified the Biotics Export SQL scripts so that elements can be selected by either a working list or a list of element IDs. The SQL must be edited in order to run, which helps prevent users from exporting the wrong data.</td>
<td>N</td>
</tr>
<tr>
<td>Biotics Export/Import</td>
<td>Updated Import into Biotics guidelines</td>
<td>N</td>
</tr>
</tbody>
</table>