MARIN BIODIVERSITY 2026







Marin Biodiversity Synthesis Group

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This report is dedicated to the memory of Laura Lovett, a tireless advocate for biodiversity policy and action in Marin, who passed away earlier this year.

EXECUTIVE SUMMARY

Our global environmental crisis is widely recognized to have three inter-related components: biodiversity loss, climate change and pollution. Biodiversity loss may now be at its highest level in 65 million years. Fortunately, there is now international consensus on the way forward to meet this challenge at all levels. This is the Kunming-Montreal Global Biodiversity Framework (KMGBF or GBF), approved in 2022 by almost all nations of the world at the fifteenth meeting on implementation of the international Convention on Biological Diversity (COP15). At this meeting, all parties also agreed to produce national biodiversity plans before the next meeting (COP16), held in 2024. COP17, to take place late in 2026, will evaluate progress toward implementation of the plans.

The United States is the only member of the United Nations not to have signed the Convention on Biological Diversity. It is also lacking a national biodiversity plan. In response to the lack of action at the national level, California has stepped up its biodiversity efforts. It has been granted Observer status by the Convention, as have different local governments and non-governmental entities within the state. Delegations from California have attended both COP15 and COP16, and are expected to participate in COP17 as well. This participation is co-ordinated by the California Global Biodiversity Alliance (CalGBA).

Marin County, California, is part of an internationally-recognized center of biodiversity. For a long time, people in Marin have been doing wonderful work to preserve and enhance this local biodiversity. If Marin were part of any other country in the world, this work would be reported and evaluated as part of a national program. However, in the unusual situation that exists at present, this is not happening. For this reason, concerned citizens from Marin have come forward to gather as much information on local biodiversity as they can, to organize it according to the GBF, and to put it into the context of the planning and evaluation currently underway worldwide.

The report is the synthesis of these efforts. It updates what was summarized in the *Marin Biodiversity 2025* report. Its format allows comparison with other biodiversity reports from all over the world. It reveals the good news that much progress has been made (e.g. Targets #2 and #3). It gives cause for concern that the crisis may well be worsening, but also points out where future work may have the biggest impact (e.g. Targets #1, #4 and #14). It is an information base that can be used by the county and by its cities, towns and special districts in elaboration of policy that is needed to benefit current and future generations.

INTRODUCTION

Biological Diversity in Marin

Marin County, California, is often considered an example of great success in conservation. Separated from San Francisco by a strait of water less than 5 km wide, it resisted the tide of urbanization that swept over much of the surrounding metropolitan area, and today over half its area remains open space. Over more than a century, many of its lands have been protected from massive degradation through establishment of parks and preserves, designation of watershed areas, enactment of zoning regulations and purchase of conservation and agricultural easements.

Marin is home also to globally-significant biological diversity, and is internationally recognized as part of the Golden Gate Biosphere Network (https://togetherbayarea.org/ggbnpartoftogether/). It represents a local “hotspot” within the larger California “hotspot.” Marin’s total species richness is not known, but logical calculations can produce estimates. There are 1,096 species of native vascular plants (Howell et al. 2007). If this is about 15% of the total of all named species of all groups, as it is worldwide (Chapman 2009), then Marin is home to between 7000 and 8000 described species. Of course, this does not include those still waiting to be discovered. Most of these species are probably insects, although local inventory of insects is just beginning (da Silva & al. 2023).

With just over 0.3% of California’s land area, Marin has almost a quarter (1096 of 4976) of its native vascular plant species. Although the county does not stand out by itself as a center of plant richness or endemism, it contributes to making the San Francisco Bay Area as a whole such a center (Baldwin et al. 2017). Marin’s birds show a similar pattern. 163 avian species

probably breed in the county (Shuford 1993, p. 56). When migrants and vagrants are added, the total comes to 485 species of birds that have been sighted in Marin (W. Lenarz 2017, pers. comm.); this is over two-thirds of the 666 reported from all of California.

Yet Marin's biodiversity is now increasingly at risk, as is biodiversity globally, from factors that know no boundaries, such as habitat fragmentation, invasive species, climate change, sea level rise and pollution. Available information indicates that Marin is probably now experiencing major loss of biodiversity. (Details are found under Target #4). Furthermore, increasing human demand for food, shelter, energy and other resources may be expected to increase pressure on biodiversity here as elsewhere. (County of Marin 2007, IPBES 2019, One Tam 2023). In addition, long neglect of environmental justice needs to be remedied, and an important component of this is equitable access to benefits of biodiversity.

THE INTERNATIONAL CONTEXT

The United Nations Environment Programme's landmark report *Making Peace With Nature,* issued in 2021 (https://www.unep.org/resources/making-peace-nature), called out biodiversity loss, climate change, and pollution as the three main threats to the global environment that supports us. Consensus has been building that humans are now causing the highest rate of biodiversity loss in 65 million years – the time when the dinosaurs went extinct (Kolbert 2014). There is no reason to believe that our human species will survive this mass extinction – if we do nothing to stop it.

Fortunately, we know what to do. People all over the world have been working for over half a century to come up with plans and methods to deal with these threats and to ensure that humans and other species will be able to coexist on the planet for the optimum benefit of all. These efforts are the direct descendants of the first Earth Day, held in 1970. At that time, mounting concerns over degradation of our environment led to what many called the largest global mass demonstration in history. Two years later, the United Nations convened its first general environmental meeting, the Conference on the Human Environment, in Stockholm, Sweden. This created the United Nations Environment Programme (UNEP), which is still an important source of environmental information today.

Despite heightened public consciousness and a surge of environmental legislation worldwide, twenty years later it was clear that our environment was still deteriorating, while human needs were still increasing. Calls for more action led to the U. N. Conference on Environment and Development, popularly known as the Earth Summit, held in Rio de Janeiro, Brazil, in 1992. At this meeting, two legally binding instruments were opened for signature: the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity. Sections of each of these conventions stipulated that once they had been ratified by the required number of nations to become active, series of regular meetings would begin to guide their implementation. The nations that had ratified the conventions were known as the parties to them, and thus the meetings became known as the Conferences of Parties, or COPs.

The original Convention on Biodiversity, or CBD (https://www.cbd.int/intro), which entered into force in 1993, outlined basic goals and agreements for reaching shared global goals. The "biodiversity COPs" have taken place more or less every two years since then. The United States is the only United Nations member state that has not ratified the Convention, and thus it cannot send official delegations to the COPs. However, many people from the U.S. contributed to the initial draft of the CBD, and subsequently, different organizations and subnational governments from the U.S. have been granted Observer status and have participated in the COPs. (A separate national nature assessment was written (https://www.washington.edu/news/2026/03/26/assessment-of-nature-in-the-us-now-available-for-public-comment/), and was due to be reviewed by the U.S. National Academy of Sciences, but this process was officially killed in early 2026; it is being revived under the auspices of a non-profit organization (https://naturerecord.org/) recently organized for the purpose).

COP15 began in Kunming, China, in 2020 and ended in Montreal, Canada, in 2022, after being interrupted by the COVID19 pandemic, which was ironically one symptom of the world biodiversity crisis. COP15's theme was "Ecological Civilization," evoking China's long history. After the world's 2020 failure to meet the Aichi Targets (https://www.cbd.int/sp/targets), which had been adopted in at COP10 in Japan in 2010, the task of COP15 was to come up with a more effective plan. After much negotiation, delegations from 196 nations reached consensus on the Kunming-

Montreal Global Biodiversity Framework (KMGBF or GBF). This has 23 targets in three areas to be reached by 2030 (https://www.cbd.int/gbf/targets), plus additional goals to be reached by 2050 (https://www.cbd.int/gbf/default.shtml). COP15 additionally facilitated the submission and review of National Biodiversity Strategies and Action Plans (NBSAPs) through an on-line portal (https://www.cbd.int/nbsap). Due to the disruption caused by COVID19, much discussion of the mechanics of meeting the CBD targets was left for COP16, which was held in Cali, Colombia, in 2024. The theme of COP16 was "Making Peace With Nature," echoing the U.N. report of the same name, as well as the threat that continued warfare poses to the environment.

All parties agreed that by 2026 they would evaluate their own progress toward the goals through monitoring processes that they have selected. Much of the work of COP 17 will be consist of evaluating the progress that has been made toward the CBD targets. In advance of the meeting, a Draft Global Report on Biodiversity Progress has been prepared (https://www.cbd.int/gbf/implementation/globalreview), using information from the national reports and from other sources.

The final report will be released at COP17. The draft suggests that the world is not now on course to meet the 2030 targets or mission or the 2050 goals or vision of the GBF. In other words, we are not doing enough and must work harder. This conclusion resonates especially strongly in the United States, whose government has done nothing.

However, organizational work in the United States can build on the work of other entities. Over one hundred NBSAPs have now been submitted, by 98 countries. One of these is our neighbor to the north. Canada's national biodiversity plan (https://publications.gc.ca/collections/collection_2024/eccc/en4/En4-539-1-2024-eng.pdf) has a concise and clear approach to the 23 targets. Within Canada, both the Province of Quebec (https://biodiversite-quebec.ca/en) and the City of Montreal (https://montreal.ca/en/articles/preserving-biodiversity-collective-approach-13188) have also been world leaders in biodiversity action. The plan of our neighbor to the south is also completed (https://bioteca.biodiversidad.gob.mx/janium/Documentos/12890.pdf). Mexico's plan has six "strategic axes" (*ejes estratégicos*), 24 lines of action, and 160 actions.

The California Context

Recognizing the vacuum left by the inactivity of the U.S. government, people in California, a state that boasts both globally-significant biodiversity and the fourth-largest economy in the world (https://www.gov.ca.gov/2025/04/23/california-is-now-the-4th-largest-economy-in-the-world/), began to act to fill the gap. The California Biodiversity Network initially joined together people and organizations interested in sharing knowledge and promoting biodiversity in California (https://cabiodiversitynetwork.org/). This was accompanied by the preparation of the Charter to Secure the Future of California's Biodiversity (also known as the California Biodiversity Initiative) in 2017. (https://www.californiabiodiversityinitiative.org/). Formal recognition of the Charter and the importance of biodiversity in California came from Executive Order B-54-18 of Governor Jerry Brown in 2018, which also established September 7th as California Biodiversity Day. This was followed by Governor Gavin Newsom's Executive Order N-82-20 in October 2020, as well as by subsequent legislation approved by the state legislature and signed by the governor, such as AB 1889 ("Room to Roam" Act) in September 2024.

Meanwhile, the California Global Biodiversity Working Group (CGBWG) (https://storymaps.arcgis.com/stories/cccaf594b32744a4a220e447df2498c8) helped to organize, prepare and co-ordinate the participation of the Extended California Delegations to COP15 and COP16. One of the results of the delegation's participation in COP15 was the international adoption of California's goal to preserve 30% of all lands and waters by 2030 ("30 x 30"). California's delegation grew to over 100 members at COP16, including representatives from the governor's office, the state legislature, local governments, and many educational institutions and environmental organizations. The California delegates to COP16 presented the state's progress toward the GBF targets to the other nations of the world, and also to the other state, provincial and local government representatives who participated in the parallel Eighth Summit of Subnational Governments (https://cbc.iclei.org/8th-summit-for-subnational-governments-and-cities/). Particularly significant at COP16 was the exchange of information, and indeed, a friendly rivalry, between California and the Canadian Province of Quebec, both subnational governments on the same continent.

After returning to California, participants continued to to disseminate within the state information about what is happening outside it. In preparation for COP17, to be held in Yerevan, Armenia, in October 2026, and also to further advance biodiversity work in California, CGBWG re-organized as the California Biodiversity Alliance and launched a new website (www.CalGBA.org). This will help people in California reach one of the important targets (#14) of the GBF: "Integrate Biodiversity into Decision-Making at Every Level."

The Local Context

There has also been strong action at the local level in California. For local governments, the City of Los Angeles took the lead with its Biodiversity Resolution of 2015 (https://cityclerk.lacity.org/onlinedocs/2015/15-0499-S4_reso_01-31-2023.pdf). This led to the preparation of numerous biodiversity materials (https://sanitation.lacity.gov/san/faces/wcnav_externalId/s-lsh-es-si-bd-par?_adf.ctrl-state=1dr6ahf9tb_78&_afrLoop=12582752440923941#!), including the first adoption and adaptation in the United States of the City Biodiversity Index (https://www.cbd.int/article/2021-singapore-index), first launched in 2008 by Singapore at COP8 in Bonn, Germany. Use of the index involves the selection of a set of indicators that will help the city measure progress at intervals in the future. An integral part of the L.A. effort was the modification of the original index to better track improvements in biodiversity equity across neighborhoods. Close collaboration with faculty and students at UCLA has been an integral part of all of these efforts (https://escholarship.org/uc/item/4c81w4nr).

In November 2025, the County of Los Angeles, spurred by intense concern by young people throughout it, became the first California county to pass a biodiversity resolution to guide its future biodiversity work. This includes joining CalGBA and seeking official observer status with the CBD (https://file.lacounty.gov/SDSInter/bos/supdocs/209826.pdf_). In June 2026, the City of Mountain View became the first city in the San Francisco Bay Area to adopt a biodiversity plan (https://collaborate.mountainview.gov/biodiversity) (https://www.mv-voice.com/environment/2026/06/29/mountain-view-adopts-long-anticipated-biodiversity-urban-forest-plan/). The City of San Francisco has not engaged in the same kind of action, but it does have biodiversity guidelines for all city projects (https://www.sfenvironment.org/city-san-francisco-biodiversity-guidelines). In May 2026, the City of Encinitas in southern California took a big step forward to protecting its biodiversity with a groundbreaking native plant ordinance, (https://www.encinitasca.gov/government/departments/development-services/policy-planning-housing/policy-planning/native-plant-ordinance)

Currently, UCLA is becoming the first university to begin the biodiversity index process. It is working to adapt the City of Los Angeles Biodiversity Index to its own campus situation (https://www.thegpsc.org/sites/default/files/3._isaac_brown_nurit_satz_labiodiversityindex.pdf). This effort recognizes that colleges and universities represent in fact a level of local government parallel to cities and towns.

The Marin Context

Marin is well-known outside its boundaries as a popular recreational destination right next to intensely-urbanized San Francisco. The natural environment and locally-produced food are two of the main magnets. Both of these would not exist today were it not for an almost equally well-known series of battles to prevent the county's wholesale urbanization (Fairley 1987, Griffin 1998, Meyer 2006). Yet much more has been done in Marin to preserve and enhance biological diversity than the history of these struggles reveals. The full diversity of biodiversity work in Marin deserves to be better appreciated. Knowing what has been done is also necessary to know what still needs to be done.

A big step toward this goal was taken on August 20, 2024. On that day, thanks to the organizational efforts of Supervisor Dennis Rodoni and aide Morgan Patton, many people involved in diverse projects gathered at the Marin County Civic Center to better inform the public and the Marin County Board of Supervisors about their work. Represented were Marin Parks and its partners in the Tamalpais Lands Collaborative (One Tam) and also the following additional organizations:

--Environmental Action Committee of West Marin (EAC)

--College of Marin Naturalist/Biodiversity Program.
--Marin Audubon
--Turtle Island Restoration Network (TIRN)
--River Otter Ecology Project
--California Native Plant Society (CNPS), Marin Chapter
--Alameda del Prado Biodiversity Project
--Marin Monarch Working Group (MMWG)
--University of California Co-operative Extension, Marin County
--Chileno Valley Newt Brigade
--Marin Biodiversity Corridor Initiative (MBCI)
--350 Marin
--Resource Renewal Institute and Bay Area Power and Nature Regional Group
--California Global Biodiversity Working Group
--Cleaner California Coast
--Federated Indians of Graton Rancheria (through Supervisor Rodoni).

In addition, other organizations such as the Marin Conservation League (MCL), the Marin Group of the Sierra Club, Point Blue Conservation Science, and the California Academy of Sciences (CAS) have contributed greatly to biodiversity efforts in Marin County. A full list of organizations available to share knowledge and recommendations in Marin would likely be comparable in length to that assembled by the City of Los Angeles as it began to organize information on its biodiversity.

At the same August meeting, after the presentations, the Board of Supervisors adopted a resolution recognizing the importance of Marin's biodiversity, proclaiming September 2024 as Biodiversity Month and furthermore resolved that "Marin County Parks and Open Space will embark on research initiatives and forge essential partnerships to send a delegation to a future Conference of Parties Convention on Biodiversity to demonstrate Marin County's dedication to the protection and enhancement of biodiversity on a local and global scale."

Although logistical challenges prevented the County of Marin from sending official representatives to COP16, people from Marin did participate. The College of Marin sent representatives, and several Marin residents attended as representatives of environmental organizations, including one of the members of the California Global Biodiversity Working Group Steering Committee. At present, the College of Marin and Marin Parks are both members of CalGBA, and the College of Marin continues to hold Observer status with the CBD. In June 2025, The College of Marin Board of Trustees adopted an Environmental Responsibility Policy (BP 6560) that is based on the *Making Peace With Nature* report and thus explicitly points out biodiversity as an area of emphasis.

As the world prepares for COP17, this present report updates the information already presented in the *Marin Biodiversity 2025* report. As in that report, this one organizes the publicly-available information on Marin's biodiversity according to the GBF. In the absence of guidance from the United States government, information on the thematic areas "What We Are Doing" and "Going Further" sections of the Canadian national plan (Annex 1, pp. 26 to 121) is excerpted for comparison. (There is more detailed information on specific measures already taken or to be taken as well in these sections, as well as two additional sections, "Current Status" and "Challenges and Opportunities, under each target in Annex of the Canadian plan; this gives a much better idea of the specific actions taken and contemplted).

Presentation of Biodiversity Information From Marin

In the following pages, Marin's biodiversity information is summarized according to the three areas and 23 targets of the GBF.

AREA 1 – REDUCING THREATS TO BIODIVERSITY

TARGET 1: SPATIAL PLANNING AND EFFECTIVE MANAGEMENT

Plan and Manage All Areas To Reduce Biodiversity Loss

"Ensure that all areas are under participatory, integrated and biodiversity inclusive spatial planning and/or effective management processes addressing land- and sea-use change, to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities."

The boundaries of Marin County include lands under the control of many different governments, groups and individuals. The best-known governments are those of the United States, the state of California, the County of Marin, and the eleven different incorporated cities and towns – Belvedere, Corte Madera, Fairfax, Larkspur, Mill Valley, Novato, Ross, San Anselmo, San Rafael, Sausalito, and Tiburon. Lands are also managed by other public districts such as the Marin Municipal Water District (MMWD), the Bolinas Community Public Utility District, the Marin Community College District and local school districts. Private organizations such as All Hands Ecology, Marin Audubon, Marin Open Space Trust (MOST) and others also own and manage lands. Land in private ownership in urban and suburban areas is mostly in small parcels, mainly supporting homes and gardens, while land in more rural areas tends to be in larger parcels supporting grazing and crops. Historically in Marin, as elsewhere, not all groups of people have had equal influence over how lands and waters are managed. Notably, communities composed largely of Native Americans, African-Americans and recent immigrants have had much less input into management decisions. This is the cause of the environmental injustice that still remains today. More efforts have been made in recent years to include indigenous peoples and local communities in decision-making.

U.S. government lands and waters are administered by the National Park Service (NPS), the U.S. Fish and Wildlife Service (USF&WS) and the National Oceanic and Atmospheric Administration (NOAA). Each agency has a distinct planning process resulting in planning documents. Examples from the U.S. government are the general management plans for the Golden Gate National Recreation Area (GGNRA) and the Point Reyes National Seashore (PORE) (https://www.nps.gov/articles/natural-resource-condition-assessments-published-for-golden-gate-and-point-reyes.htm) and (https://www.nps.gov/pore/getinvolved/upload/planning_gmp_1980.pdf and https://www.nps.gov/pore/getinvolved/planning_gmp_amendment.htm and https://parkplanning.nps.gov/projectHome.cfm?projectID=15075).

California State Parks prepares plans as the needs arise (https://www.parks.ca.gov/?page_id=27202) but also for specific units (https://www.parks.ca.gov/?page_id=21299). Plans for different units in Marin do exist, of different ages and coverages. Examples are those for Tomales Bay State Park (https://www.parks.ca.gov/pages/470/files/00tomalesbaygpfeb05.pdf), Angel Island State Park (https://catalog.hathitrust.org/Record/010837837), and Mount Tamalpais State Park (https://www.parks.ca.gov/?page_id=28226). China Camp State Park has unique status as a state park managed by a non-profit organization (https://wp.kahl.net/china-camp-how-to-operate-a-state-park-in-2025/).

The current Marin Countywide Plan (County of Marin 2007) provided for the people of Marin County, through their elected Board of Supervisors, and through comments to the Marin Community Development Agency, to participate in planning for unincorporated lands not reserved by state or Federal governments. Marin's incorporated cities and towns, as well as state and Federal agencies, also have procedures that allow for public participation in the processes of formulating and implementing plans for lands and waters under their jurisdiction.

While Section 2-2 of the 2007 Countywide Plan mentions biodiversity, and its section 2-4 addresses biological resources, both of these sections acknowledge continuing threats and neither explicitly presents the goal or provides guidance for

reaching zero loss of biodiverse areas by 2030. Most plans of cities and counties likewise lack strong and unified biodiversity policy sections, although most do address some aspects of biodiversity conservation somewhere.

Marin County Parks has planning processes that in some ways parallel state and federal planning, yet similar needs across the large number of parcels make more feasible general planning for these specific needs, such as for trails and vegetation management (https://data.marincounty.gov/stories/s/Parks-Annual-Report-FY-2024-2025/2vq7-4z2e/), rather than preparation of distinct plants for the different units. MMWD has taken a similar approach (https://marinwater.org/mt-tam-watershed/watershed-recreation-management-planning/).

A large portion of Marin's privately-owned agricultural land is covered by conservation easements held by the Marin Agricultural Land Trust (MALT) The wording of each easement purchase document guides how conservation will be effected on the lands it covers, and MALT conducts periodic inspection and consultation about implementation (https://malt.org/conservation-easements/).

Some agencies have prioritized areas of high biodiversity for protection. The NPS has prepared Natural Resource Condition Assessments for the GGNRA and PORE) (https://www.nps.gov/articles/natural-resource-condition-assessments-published-for-golden-gate-and-point-reyes.htm). The Marin Municipal Water District has designated "Legacy Zones" and "Ecosystem Protection" zones (https://marinwater.org/wp-content/uploads/2020/09/Biodiversity-Fire-and-Fuels-Integrated-Plan.pdf, p. 3-35). New and exciting innovations have have made the identification of these areas more feasible than ever before. Chief among these is the Fine-Scale Vegetation Mapping project (https://www.nps.gov/articles/vegetation-mapping-projects-underway.htm?utm_source=article&utm_medium=website&utm_campaign=experience_more&utm_content=small, (https://vegmap.marincounty.org/ and **https://www.nps.gov/articles/000/marin-county-fine-scale-vegetation-map-complete.htm)**. This project used remote sensing to identify specific units of vegetation. Ground-truthing for some sites, particularly grassland areas, is still needed, but mapping of other vegetation types essentially has been completed.

Canadian Comparison

What We Are Doing -- Areas of Action:

Expanding and effectively managing the network of federal protected and conserved areas
Recognizing Other Effective Area-Based Conservation Measures (OECMs)
Increasing ambition via Nature Agreements
Supporting Indigenous-led conservation
Identifying and creating ecological corridors
Conserving privately protected areas

Going Further

Define areas of high biodiversity importance (e.g., KBAs), including ecosystems of high ecological integrity, and make publicly accessible maps of these areas.

Reinforce the value of spatial planning in areas of land and freshwater under federal jurisdiction.

TARGET 2: ECOSYSTEM RESTORATION

Restore 30% of all Degraded Ecosystems

"Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective

restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity."

Although Marin resisted urbanization longer than many other areas of the San Francisco Bay Area, it was integrated economically and politically into this region shortly after the first European contact. The ensuing two hundred years of logging, fire suppression, mining, grazing, cultivation, damming, and construction for military, industrial, residential and recreational purposes have resulted in almost all of its lands and waters becoming degraded to some extent.

Fortunately, recognition of this situation has led to an extraordinary number of restoration projects, although it is difficult to determine what percentage of degraded lands they affect and how effective the restoration has been. These projects have been undertaken by public agencies, non-profit organizations, and individuals.

Agency-initiated projects include those at Point Reyes National Seashore for coastal dunes and wetlands (https://www.nps.gov/pore/getinvolved/planning_giacomini_wrp_restoration.htm; https://www.nps.gov/pore/getinvolved/planning_dunerestoration_importance.htm; https://www.nps.gov/pore/getinvolved/planning-drakes-estero-restoration-project.htm), at Tomales Bay State Park (https://www.parks.ca.gov/pages/470/files/TomalesBay_Final%20PWP.pdf) and Roy's Redwoods Open Space Preserve for for forests (https://www.onetam.org/our-work/roys-redwoods), at Redwood Creek (https://www.nps.gov/articles/redwood-creek-salmon-habitat-enhancement.htm) and Lagunitas Creek (https://www.marinwater.org/node/1213) for freshwater streams, and at Novato Baylands (https://www.pointblue.org/our-work/education/novato-baylands/) for salt marshes and adjacent habitat. Some projects of the Marin Wildfire Prevention Authority (MWPA) may also be characterized as restoration projects, especially those aimed at making it possible to return beneficial fire to landscapes through construction and maintenance of shaded fuelbreaks and other measures(https://www.marinwildfire.org/). Several agencies maintain their own native plant nurseries for restoration projects: these include the National Park Service (https://www.nps.gov/places/000/marin-headlands-native-plant-nursery.htm) and the County of Marin. (https://www.parks.marincounty.gov/discoverlearn/nativeplantnursery).

Non-governmental organizations leading efforts to restore lands and waters include Marin Audubon (https://marinaudubon.org/stewardship-restoration/), Friends of Corte Madera Creek Watershed (https://friendsofcortemaderacreek.org/projects/habitat-enhancement/) and Students and Teachers Restoring a Watershed (https://www.ecoliteracy.org/article/straw-students-and-teachers-restoring-watershed). A new partnership between the Nature Conservancy and Point Reyes National Seashore is seeking to restore lands that were formerly sites of dairy ranches (https://www.nps.gov/pore/learn/news/newsreleases-20250108-gmp-amendment-revised-rod-and-settlement-agreement.htm) (https://www.nature.org/en-us/about-us/where-we-work/united-states/california/stories-in-california/point-reyes-path-forward/)

Because such a large proportion of un-urbanized Marin is privately-owned ranch land, the initiatives of private landowners to initiate restoration projects are especially important. In Marin, these projects are often undertaken with the collaboration of the Marin Agricultural Land Trust (https://malt.org/farmland-stewardship/) and the Marin Resource Conservation District (https://www.marinrcd.org/marin-rcd-programs and https://www.marinrcd.org/files/15bbc5f34/TendingTheEdges.English.Reducedpdf.pdf). Hedgerows, windbreaks and creek buffers have been the results of some of these restoration efforts. In certain places, fencing off sensitive zones has allowed native plants to recover from existing seed banks, and in other areas, native species have been replanted. Many of the restoration projects on agricultural lands in Marin have been going on for decades (https://malt.org/ranching/brazil-family/) and have offered opportunities for comparing the impacts of actions undertaken through paired before-and-after or with-and-without counts of chosen groups of species (most commonly birds and fish).

For the foreseeable future, most of the working lands of Marin will continue to rely on mixtures of native and introduced species. Introduced mediterranean grasses and forbs provide valuable forage for cattle and other introduced ruminants, and windbreaks of exotic trees (mostly *Eucalyptus* and *Cupressus* species) may decrease erosion. Replacing the exotic trees with native ones must be done with care to avoid negative impacts on the of the declining monarch butterfly *(Danaus plexippus*), which relies on these species at some of its overwintering sites. Most rangelands are not and probably cannot be managed to eliminate exotic species, but they can be managed to increase the proportions of native ones.

The concept of re-wilding (Carter *et al*. 2021) has been the subject of much discussion recently in Marin. Partly this is because so much of the county's area has been highly modified for so long, and partly it is because recent changes have offered new opportunities for restoration of two conspicuous landscapes. One change was the removal of commercial livestock ranching and an oyster farm from different areas of the Point Reyes National Seashore (https://www.nps.gov/pore/learn/news/newsreleases-20250108-gmp-amendment-revised-rod-and-settlement-agreement.htm), and the other was the purchase of the San Geronimo golf course by the county of Marin (https://www.marinij.com/2024/04/03/marin-county-finalizes-purchase-of-former-san-geronimo-golf-course/). In comparison to the county's size, these changes represent significant additions to a contiguous area of protected lands, one key goal of rewilding. However, because the county as a whole is rather small, it is not yet clear whether natural processes will be able to dominate on the restored lands, another of rewilding's objectives.

Projects focused on removal and management of invasive species are often classified as restoration projects, but they are here treated in the discussion of Target #6. Also, although some projects aimed at improving biodiversity in urban and suburban areas might qualify as restoration, they are included under Target #12. An important need is to determine the extent of degraded lands in order to calculate how large an area will be required to meet this goal.

Canadian Comparison

What We Are Doing -- Areas of Action:

Committing to restore degraded areas (at least 19 million hectares by 203)
Investing in ecosystem restoration action
Undertaking science and research on effective restoration
Preventing and mitigating degradation through existing regulatory and policy frameworks
Improving and strengthening supply chains (e.g., securing seed sources), supporting training, capacity building, and Indigenous leadership in seed conservation and restoration, addressing policy gaps, and ensuring the required infrastructure is in place (e.g., for housing native seed sources).
Supporting collaborations and facilitating the exchange of knowledge and information necessary to advance restoration-related science, practice, and policy

Going Further:

Working to define "degraded areas" and "effective restoration", identify degraded areas to establish a terrestrial and aquatic baseline for the target, assess priority areas for restoration, and facilitate reporting on progress.

TARGET 3: PROTECTED AND CONSERVED AREAS (30X30)

Conserve 30% of Land, Waters and Seas

"Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes,

recognizing and respecting the rights of indigenous peoples and local communities, including over their traditional territories."

Marin almost certainly met this target many years ago, for most sources agree that at least half of the county's area is protected in some way. Different protected units offer different degrees of protection. Greater specificity in expressing the percentages of areas of different levels of protection could be achieved by applying the International Union for the Conservation of Nature's criteria classifying these areas (https://portals.iucn.org/library/sites/library/files/documents/pag-021.pdf).

Protected areas managed by the U.S. government include those administered by the National Park Service (Point Reyes National Seashore, Muir Woods National Monument, and the Golden Gate National Recreation Area), the U.S. Fish and Wildlife Service (San Pablo Bay National Wildlife Refuge), and the National Oceanic and Atmospheric Administration (Cordell Bank, Gulf of the Farallones and Monterey National Marine Sanctuaries). Those managed by the state of California include Angel Island, China Camp, Mt. Tamalpais, Olompali, and Tomales Bay State Parks. Marin Parks administers an additional 34 open space preserves.

The Marin Municipal Water District and the North Marin Water District manage their lands primarily for water production, but achieving this requires a high level of protection.

Private organizations that aim to manage lands in natural conditions include All Hands Ecology (Audubon Canyon Ranch and the Cypress Grove Research Center), Marin Audubon (Novato Baylands), the Boy Scouts of America (Camp Tamarancho), and the Marin Open Space Trust (list at https://marinopenspacetrust.org/).

Because urbanization proceeded generally from east to west and from sea level upwards, low-lying lands in the eastern part of the county are under-represented in the protected areas. Overall, those from Mt. Tamalpais west to the Pacific Ocean form a large contiguous unit, but those in eastern Marin suffer from fragmentation and lack of connectivity.

Fortunately, little by little, conservation groups and government agencies are adding to the extent of area protected in the areas most threatened. Various examples illustrate how successful partnerships have worked. Different pieces of Bowman Canyon in northeastern Marin near Novato were added to the county parks system in 2018 and 2020 (https://www.parks.marincounty.gov/projectsplans/bowman-canyon). In 2026, Marin Audubon completed purchase of bayside property, also near Novato (https://marinaudubon.org/2026/06/15/marin-audubon-society-closes-deal-for-novato-baylands/). In 2023, the Wall Property was protected near Fairfax (https://marinopenspacetrust.org/projects/save-the-wall-property/). In 2026, the top of King Mountain near Larkspur was protected (https://www.marinij.com/2026/05/28/marin-county-to-get-long-sought-king-mountain-property/). In 2024, a long struggle succeeded in protecting one of the last areas on the Tiburon Peninsula in southern Marin (https://www.thearknewspaper.com/live/martha-belongs-to-marin-land-deal-complete-as-110-acre-tiburon-ridge-parcel-now-open-space-preserve).

Unfortunately, as happened throughout the United States, indigenous peoples historically were not consulted when lands were "protected." Fortunately, there are now pathways toward remedying at least part of this injustice through co-management agreements and the "land back" movement. In 2021, a historic government-to-government agreement was signed by the United States and the Federated Indians of Graton Rancheria (FIGR) to co-manage Point Reyes National Seashore (https://gratonrancheria.com/federated-indians-of-graton-rancheria-and-point-reyes-national-seashore-announce-partnership/;https://www.nps.gov/pore/learn/news/newsreleases-20210810-general-agreement-nps-figr.htm). In 2023, the Coast Miwok Tribal Council of Marin, aided by grants and donations, acquired part of the tribe's original lands in the heart of Marin near Nicasio. In 2024, FIGR received lands back from the Western Rivers Conservancy in northwest Marin near Dillon Beach (https://norcalpublicmedia.org/2024091196270/news-feed/coastal-ranch-land-returned-to-tribal-hands-for-stewardship).

Canadian Comparison

What We Are Doing -- Areas of Action:

Expanding and effectively managing the network of federal protected and conserved areas
Recognizing Other Effective Area-Based Conservation Measures (OECMs)
Increasing ambition via Nature Agreements
Supporting Indigenous-led conservation
Identifying and creating ecological corridors
Conserving privately protected areas

Going Further:

Work to achieve multiple objectives and targets through its efforts on Target 3. Where possible, protected area selection and planning will occur in the context of regional spatial planning and—in the terrestrial environment—be informed by the finalization of KBAs (Key Biodiversity Areas). It will also help protect critical habitat for species at risk, areas under restoration, and high-carbon ecosystems, while maximizing synergies with other federal programming.

Provide additional public information on the process for recognizing OECMs.

TARGET 4: SPECIES RECOVERY

Halt Species Extinction, Protect Genetic Diversity, and Manage Human-Wildlife Conflicts

"Ensure urgent management actions to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species, to significantly reduce extinction risk, as well as to maintain and restore the genetic diversity within and between populations of native, wild and domesticated species to maintain their adaptive potential, including through in situ and ex situ conservation and sustainable management practices, and effectively manage human-wildlife interactions to minimize human-wildlife conflict for coexistence."

This is one of the most important of the GBF targets, because it directly addresses major components of declining biodiversity – loss of species and loss of genetic diversity within species. Unfortunately, it is also the one for which we have the least amount of information. No one knows how many species there are, and long-term population data exist for very of those few species we do know. So while actions taken toward reaching the other targets probably will help, it is very difficult to measure progress toward this goal. To put it another way, although we know that populations of the iconic coho salmon and monarch butterfly have plummeted in Marin, we do not know how representative they are of all of the other species living within its boundaries.

Work done to help point out those species most at risk so as to permit prioritization of efforts to protect them has been very valuable, but it falls short of real needs. The International Union for the Conservation of Nature (IUCN), composed of governmental and non-governmental members, maintains a worldwide list of threatened species, known as the "Red List" (https://www.iucnredlist.org/en). It classifies species into nine categories: extinct (E), extinct in the wild (EW), critically endangered (CR), endangered (EN), vulnerable (V), near threatened (NT), least concern (LC), data deficient (DD) and not evaluated (NE). Together, the CR, EN and VU designations are considered categories of threatened species. The United States government maintains another list of endangered and threatened species protected under the U.S. Endangered Species Act. The California state government maintains another list of species protected under the California Endangered Species Act. Additionally, non-governmental organizations such as the California Native Plant Society maintain their own lists. Because it takes years of study and often advocacy before a species makes it onto even one list, the total number of species

on all of the lists most likely represents an under-counting of the true number of species at significant risk of extinction. Also, as just mentioned, because populations of the vast majority of species are not monitored, no one really knows how well the monitored species serve as indicators for the rest.

There have been historical biases that have favored protection of some species over others on the official lists. Large, "charismatic" species, especially vertebrate animals, tend to attract more attention, and therefore are more likely to be the objects of study and advocacy that help species gain official protection on the state and Federal lists. Originally, although the U.S. Endangered Species Act allowed for protection of insects, the California Endangered Species Act did not, but this was changed in 2022 (Berenbaum 2022).

Furthermore, animals tend to receive more protection than plants, because by law they are the property of the people, who delegate their authority to the U.S. Fish and Wildlife Service on Federal lands, and to the California Department of Fish and Wildlife on all other lands, while plants are the property of the landowner. Exceptions include actions harming plants that may be subject to the California Environmental Quality Act (CEQA) trees subject to state timber harvest plans. Regardless of the insufficiencies of the lists and the protections they confer, Marin has been home to several impressive monitoring and recovery efforts of listed species. Nevertheless, information on some of the listed species and on many non-listed species gives much cause for concern.

By one count, Marin hosts 19 federally-listed and 13 state-listed endangered species and subspecies (California Department of Fish and Wildlife 2017). 10 are common to both lists, while the state list has 3 not found on the federal list, and the federal list adds 9 that are not on the state list. Thus the total number of officially recognized endangered species in Marin is 22. Of these, 12 are vascular plants, 2 are birds, 2 are insects, 2 are fish, one is a crustacean, and one is a mammal.

Likewise, there are 12 federally-listed and 9 state-listed threatened species. After accounting for the 4 species that are on both lists, there are 17 recognized threatened species. These are 5 fish, 4 vascular plants, 4 birds, 2 amphibians and one mammal. Taking into account the species that are on one list as endangered but on the other as threatened, a total of 30 Marin species are officially listed as threatened or endangered. (This does not include species not seen in over a century and presumed extinct).

Additional species that may be at high risk may be found on the lists maintained by other organizations. The current CNPS Inventory of Rare and Endangered Plants (https://rareplants.cnps.org/Search/result?frm=T&ccl=MRN) has 139 species and subspecies. For birds, in addition to 43 listed species and subspecies, one study proposed that at least 33 more be added as "Breeding Bird species of Special Concern in Marin County" (Shuford 1993, pp. 69-72).

One study for one part of Marin (Mt. Tamalpais) concluded that of the major taxonomic groups, fish merited significant concern, plants, birds, amphibians and reptiles deserved caution, mammals were in good condition, and insufficient information was available for insects (One Tam 2023; https://www.onetam.org/sites/default/files/pdfs/Peak_Health_2023_FINAL_MAR2024.pdf)).

Troubling information about populations of birds in general (not only listed species) have come from more recent studies. Monitoring of 55 species of birds in Marin from 1996 to 2022 found that populations of 28 (51%) were increasing or stable, 6 (11%) had either uncertain trends or were considered stable, 4 (7%) showed moderate to possible large decreases, and 17 (31%) showed large decreases (Cormier *et al.* 2023 and https://mccmeetingspublic.blob.core.usgovcloudapi.net/marinwtrca-meet-14b942455c76452d948641e99cd309f8/ITEM-Attachment-001-9f5c4239299b494aab96812ed6871c91.pdf). A new report on seabirds released in early 2026 revealed a large decline in shorebird populations – from 25% to 85% (https://sfbaystateofthebirds.org/). The Marin Breeding Bird Atlas (https://marinaudubon.org/birds/marin-county-breeding-bird-atlas/) is an ongoing study of birds in Marin that is expected to produce more information on population trends.

Although all species on the Federal lists must have species recovery plans written and critical habitats designated, a particularly notable group of species is that endemic to serpentine habitats, which host a notable concentration of Marin's endangered plants and insects (https://ecos.fws.gov/docs/recovery_plan/980930c_v2.pdf). Several of these species are the targets of special monitoring and protection efforts on the Tiburon Peninsula by Marin Parks, where genetic diversity is a special concern in the Tiburon jewelflower (*Streptanthus glandulosus ssp. niger*) and the Tiburon mariposa lily

(*Calochortus tiburonensis*). The wildflowers of Ring Mountain have been the beneficiaries of a special docent program sponsored by Marin parks and the Marin Chapter of the California Native Plant Society (https://parks.marincounty.gov/discoverlearn/docents). Baker's larkspur (*Delphinium bakeri*) has not been so lucky; its one population is inconspicuous and has been repeatedly at risk from road maintenance activities. Some of Marin's plant species have benefited from *ex situ* conservation through seed banking and planting at botanical gardens.

Marin is also home to a popular effort to establish, protect and monitor populations of the Federally-listed Mission Blue butterfly (*Icaricia icariodes missionensis*); this work is sponsored by the Golden Gate Parks Conservancy and benefits from the help of many volunteers. (https://www.parksconservancy.org/park-e-ventures-article/mission-blues-oakwood-valley). Another iconic butterfly species is the monarch (*Danaus plexippus*), whose western populations have dropped sharply.. Although it was recently proposed for Federal listing, local volunteers now organized into the Marin Monarch Working Group (https://www.marinmonarch.com/) have not waited for this action to engage in many actions to benefit it. These include twenty years of monitoring its overwintering populations and protecting and improving its breeding and migratory habitats. The Marin Monarch Working Group has also broadened its scope to other butterflies, most notably by helping with the North American Butterfly Association's Fourth of July butterfly counts (https://naba.org/butterfly-counts/). Bee monitoring has been a relatively new effort on Mt. Tamalpais (https://www.onetam.org/tamalpais-bee-lab). Although not specifically focused on Marin, the most recent analysis of data for butterflies (some of the best-known insects) from across the United States revealed sharp declines (Edwards et al. 2025); this raises questions about the status of insects in general in Marin. Efforts to monitor the endangered Myrtle's silverspot butterfly (*Speyeria zerene puntareyes*) have improved thanks to an innovative project of fine-grained mapping and observation that first focused on identifying likely habitat for the larval host plant, then located the plants; this involved the Point Reyes National Seashore Association (PRNSA) and volunteers in a community science project (https://ptreyes.org/news/mappingthepurple/).

Of all the fish of Marin, another migratory species, the endangered local coho salmon *(Oncorhynchus kisutch*) runs have attracted the most attention. These helped to spur the restoration efforts in Redwood and Lagunitas Creeks mentioned under Target #2. These involve many public agencies and the Salmon Protection and Watershed Network (SPAWN), a local nonprofit (https://seaturtles.org/spawn/). Protecting and restoring coho salmon is a particularly difficult challenge because of changes to their two main habitats, the Pacific Ocean and local streams.

Amphibians that have received special attention in Marin are the foothill yellow-legged frogs (*Rana boylii*) and the California Newt (*Taricha torosa*). The Marin Municipal Water District has been conducting monitoring programs for the frogs, a California endangered species (https://marinwater.org/wp-content/uploads/2023/09/Foothill-Yellow-legged-Frog-2018-19.pdf), and has also run a popular docent program that teaches visitors not to step on frog eggs deposited in places where trails cross creeks. The California newt, a state species of special concern, has inspired the formation of a special local group of volunteers, the Chileno valley Newt Brigade (https://www.chilenovalleynewtbrigade.org/), who rescue newts during the winter migration season and put them out of danger from passing vehicles. Their efforts have also benefitted other amphibians, most notably the California red-legged frog (*Rana draytonii*); they are worth examining more closely in light of California's new "Room to Roam" Act, which focuses on the need to make it easier for animals to move between different patches of habitat (https://biologicaldiversity.org/w/news/press-releases/governor-signs-bill-to-improve-californias-wildlife-connectivity-2024-09-28/).

A relative success story among the endangered birds of Marin has been the northern spotted owl (*Strix occidentalis caurina*) Although greatly diminished in more northern areas, it seems to be holding its own in Marin, especially at Muir Woods National Monument, although competition and interbreeding with the barred owl (*Strix varia*) is a concern (https://www.nps.gov/pore/learn/nature/birds_spottedowl.htm). The snowy plover (*Charadrius nivosus nivosus*) has been the subject of intensive protection and recovery efforts at Point Reyes National Seashore; these also include a docent program (https://www.nps.gov/pore/learn/nature/birds_snowyplover.htm). Long-term monitoring efforts include the Christmas Bird Counts sponsored by the National Audubon Society (https://www.audubon.org/community-science/christmas-bird-count); Marin Audubon is a key local participant (https://marinaudubon.org/).

Populations of three bat species considered to be Species of Special Concern by the California Department of Fish and Wildlife, the pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynnorhinus townsendii*), and the Western red bat

(*Lasiurus blossevillii*) have been monitored by One Tam and have found to be reasonably stable. Tule elk (*Cervus canadensis nannodes*), once near extinction, now has numbers in California as a whole that are considered large enough to permit hunting at several sites, but it may be at risk of decreased genetic diversity due to the historical bottleneck. Once locally extinct in Marin, it was re-introduced to Point Reyes National Seashore, where its population has been monitored regularly for many years. Another species not at risk globally but of great interest in Marin is the North American River Otter (*Lontra canadensis*). Its sightings are reported regularly by the River Otter Ecology Project (https://riverotterecology.org/).

Although there is no concerted program to maintain diversity of domesticated species, Marin is home to many farmers, ranchers, and gardeners who maintain many varieties and breeds of these plants and animals. Many of these may be seen at the local farmers' markets and the annual Marin County Fair. The Golden Gate Chapter of the California Rare Fruit Growers (https://golden-gate.crfg.org/) has members in Marin, and the Marin Master Gardeners (https://ucanr.edu/site/uc-marin-master-gardeners) and Marin's community gardens (https://ucanr.edu/site/uc-marin-master-gardeners/marin-community-gardens-map) also propagate many traditional varieties of fruits and vegetables each year.

A major human-wildlife conflict in Marin involves the coyote (*Canis latrans*). Once common in Marin, it was greatly diminished by hunting and poisoning campaigns after European settlement. While Marin remained mostly rural, the county agricultural commissioner maintained a lethal control program through contract with the United States Department of Agriculture, mainly to protect sheep. As Marin urbanized and public opinion shifted, pressure grew to adopt a different approach. Project Coyote (https://projectcoyote.org/), founded in Marin, played an important role in these changes. In 2001, the county established a non-lethal program to protect sheep from coyotes. People have reached different conclusions about the success of this program (https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1409&context=hwi and https://projectcoyote.org/wp-content/uploads/2015/03/PC-Marin-County-Livestock.pdf). As coyotes have expanded their populations into more urbanized areas, residents have complained about coyotes attacking pets; these concerns have mostly been dealt with by urging people to keep their pets indoors, which in turn may have benefitted other species, mainly songbirds.

Canadian Comparison

What We Are Doing -- Areas of Action:

Supporting meaningful Indigenous participation and leadership in the implementation of the Species at Risk Act (SARA) and biodiversity conservation
Protecting and recovering species at risk (SAR) through federal programming and initiatives
Managing biological collections
Delivering human-wildlife co-existence programming
Supporting coordination for species protection and recovery with provinces and territories, Indigenous governments, and other critical partners
Implementing the Migratory Birds Program

Going Further:

Explore ways to improve the transparency and implementation efficiency of the SARA program.
Improve implementation of SARA by continuing to advance listing decisions for aquatic species, assessed as endangered or threatened by COSEWIC, applying a streamlined and efficient listing process.

Increase knowledge sharing of data, information, and results such as SAR data through Canada's Open Data Portal and via web-based Species at Risk mapping.

TARGET 5: EXPLOITATION OF SPECIES / WILD SPECIES HARVESTING, USE, AND TRADE

Ensure Sustainable, Safe and Legal Harvesting and Trade of Wild Species

"Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation, minimizing impacts on non-target species and ecosystems, and reducing the risk of pathogen spillover, applying the ecosystem approach, while respecting and protecting customary sustainable use by indigenous peoples and local communities."

Harvesting of wild animals in Marin is controlled by the California Department of Fish and Wildlife (CDFW), except on those Federal lands where the U.S. Fish and Wildlife Service has jurisdiction. CDFW establishes licenses, seasons and limits for hunting and fishing based on the best available data. The black-tailed deer (*Odocoileus hemionus columbianus*) has long been hunted in Marin, and deer hunting continues on private land. Duck hunting on tidelands continues to be popular, Although several fish species may be legally taken (https://wildlife.ca.gov/Fishing-in-the-City/SF/Gofish/North), probably the freshwater fish that attract the most public attention are the introduced species of trout stocked in reservoirs. Private clubs such as the Marin Rod and Gun Club (https://www.marinrodandgunclub.com/) have for decades promoted conservation and responsible harvesting of fish and game.

Concern over poaching of intertidal invertebrates at the Duxbury Reef State Marine Conservation Area (SMCA) led to the formation of the Duxbury Docent Program (https://www.eacmarin.org/duxbury-docents). This was spearheaded by a local nonprofit, the Environmental Action Committee of West Marin (EAC), and received the full support of Marin County Parks.

It is more difficult to determine whether wild plants are being harvested sustainably. They are generally legally protected on public lands, but it difficult to know how effective this protection is. A large-scale international poaching ring targeting plants of the genus *Dudleya* hit the California coast in 2018 (https://www.theguardian.com/us-news/2022/mar/20/california-succulent-smuggling-dudleya). This led to new state legislation that established stiff penalties for removal of these plants from their native habitats (https://www.cnps.org/conservation/dudleya-protection).

Mushrooms are also popularly harvested in Marin. Although they are not plants, responsibility for their protection also falls to landowners. The different land management agencies regulate whether mushrooms can be harvested and how many. The local mycological societies provide helpful information.

Amounts of unsustainably harvested wild species being imported into Marin are not known. However, many consumers in Marin increasingly try to buy products certified by organizations such as the Forest Stewardship Council.

The co-management agreement for Point Reyes National Seashore between the U.S. government and the Federated Indians of Graton Rancheria provides for the tribe's involvement in decisions about population regulation of the tule elk. Another concern statewide is about access to traditional plant collecting areas by native peoples who have been excluded from them.

Canadian Comparison

What We Are Doing -- Areas of Action:

Ensuring sustainable, safe, and legal use and harvest of fisheries
Advancing sustainable use of forests and trade of forest products
Ensuring sustainable, safe, and legal use and harvest of migratory birds
Ensuring sustainable and legal use, harvest, and trade of terrestrial wildlife
Supporting meaningful participation and leadership of Indigenous Peoples and building capacity to manage wild species

Minimizing impacts to non-target species

Going Further:

Develop options to enforce the legality of imports of forest products that are not listed under CITES and imports of forest risk commodities.

TARGET 6: INVASIVE ALIEN SPECIES

Reduce the Introduction of Invasive Alien Species by 50% and Minimize Their Impact

"Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent by 2030, and eradicating or controlling invasive alien species, especially in priority sites, such as islands."

Marin faces special challenges from invasive alien species (IAS). It is close to major hubs of international commerce. It has a highly mobile human population. The national regulations protecting it from introductions have relied on the "black list" (only keep out known harmful species) approach rather than the "white list" (only permit known harmless species) approach. Its protected lands are managed by many different agencies.

As in the case of rare and endangered species, it is difficult to get an exact list of how many invasive alien species there are in Marin. Information on different taxonomic groups of organisms are maintained separately, as are species considered to be problems in wild, agricultural, and urban environments.

The most complete information is for weeds. The California Department of Food and Agriculture maintains a statewide list of noxious weeds (https://www.cdfa.ca.gov/plant/ipc/encycloweedia/pdf/CaliforniaNoxiousWeeds.pdf) in three classes; these are particularly important in agricultural settings, but may not be invasive in wild settings. The California Invasive Plant Council maintains a statewide list of invasive plant species in natural areas (https://www.cal-ipc.org/plants/inventory/). The latest flora for Marin does have a Marin-specific list of invasive plants; this contains 151 species in several categories (Howell et. al. 2007).
The California Department of Fish and Wildlife maintains a short list of invasive animal species and a site for reporting others (https://wildlife.ca.gov/Conservation/Invasives/Species). However, it is not complete.

Despite the lack of information and the many challenges, Marin has been the site of several promising innovations. The Tamalpais Lands Collaborative (One Tam) has unified invasive species efforts across several different agencies. Use of the Early Detection Rapid Response (EDRR) method has increased efficiency of these efforts (https://www.onetam.org/early-detection-beyond-boundaries). The Marin Wildfire Prevention Authority (https://www.marinwildfire.org/) has incorporated control of invasive species into its plans for maintaining shaded fuelbreaks

Different governmental agencies, NGOs, and collaborations have prioritized particular habitats for removal and control of particularly threatening invasive species. Over twenty years of planning and work have successfully defended coastal dunes in Point Reyes National Seashore from European beachgrass (*Ammophila arenaria*) and iceplant (*Carpobrotus* spp.), in an effort that has involved both park personnel and volunteers (https://www.nps.gov/pore/getinvolved/planning_dunerestoration_abbottslagoon.htm). The Invasive Spartina Project (https://spartina.org/) has united multiple agencies and organizations and over many years has almost completed the eradication of invasive introduced cordgrasses (*Spartina* spp.) from San Francisco bay tidal marshes.

These successes may be outweighed by many other cases in which the invaders are clearly expanding. One of these is the very visible French broom (*Cytisus monspessulanus*). Another is the water mold causing Sudden Oak Death, *Phytophora ramorum* (https://www.suddenoakdeath.org/). Lack of more effective methods of preventing introductions as well as

shortages of budgets and personnel will make preventing and managing invasive species problems in Marin a continuing enormous problem.

Many invasive animals are already present and well established in Marin. Some are so well established that they are not often recognized as being introduced, such as the argentine ants (*Linepithema humile*) (https://cisr.ucr.edu/invasive-species/argentine-ant) and eastern fox squirrels (*Sciurus niger*) (https://baynature.org/2019/05/28/ask-the-naturalist/are-fox-squirrels-replacing-gray-squirrels-in-california/). A new and unique problem is the spread of the barred owl (*Strix varia*), native to the eastern United States, but expanding its range due to expansion of habitats that favor it. In Marin, it threatens to displace the endangered spotted owl. The National Park Service has been monitoring this situation (https://www.nps.gov/articles/barred-owls-marin-county.htm).

Many invasive insect species that are currently in other areas have not yet reached Marin, while others have arrived but have not yet become established. Examples of the first group are the South American palm weevils (https://cisr.ucr.edu/invasive-species/south-american-palm-weevil), while an example of the second group is the glassy-winged sharpshooter (https://www.marincounty.gov/news-releases/invasive-insect-discovered-grape-plants-shipped-marin). Most of those likely to be first detected are pests of economically-important plants, and for this reason, the Marin Agricultural Commissioner co-ordinates the first response. Much less information is available about invasive insect and other animal species that do not pose imminent threats to economically-important species.

During the COVID-19 pandemic, Marin was a leader in taking prompt measures to limit its damage. It rapidly implemented isolation measures to limit spread of the virus. Then, once vaccines were available, it achieved some of the highest vaccination rates in the state and the nation (https://www.marinij.com/2021/05/02/marin-covid-19-vaccine-campaign-shifts-focus-to-hesitant-residents/; https://www.marinij.com/2021/11/22/hows-california-doing-vaccinating-5-to-11-year-olds-for-covid-19/).

In all work with invasive alien species, the ideal situation would be to have strong institutions working on them at international, national and subnational levels, and also to have good communication and co-ordination among them. The current turmoil at the national and international levels creates greater challenges at the local level and makes it more difficult to reach this target.

Canadian Comparison

What We Are Doing -- Areas of Action:

Preventing new invasions
Enabling early detection of and response to new and spreading invaders
Managing established and spreading invaders

Going Further:

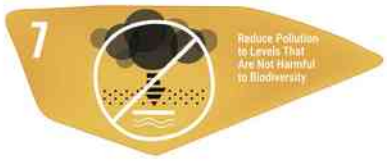
Continue to work with PTs (Provinces and Territories) to help ensure roles and responsibilities related to IAS management are clear and to identify legislative, regulatory or policy gaps that may hinder effective and coordinated IAS prevention, management and rapid response.

Work in collaboration with PTs to examine and potentially update the 2004 IAS Strategy for Canada to reflect emerging areas, such as biosecurity.

Integrate IAS considerations into existing work, such as climate change modelling as appropriate, restoration efforts, and monitoring programs.

Increase knowledge on the biodiversity and socio-economic impacts of IAS by continuing to explore or develop economic analysis and valuation methods.

Further engage Canadians and Indigenous Peoples to take part in actions to help prevent the introduction and spread of IAS, or to help control them.



TARGET 7: POLLUTION AND BIODIVERSITY

Reduce Pollution to Levels That Are Not Harmful to Biodiversity

"Reduce pollution risks and the negative impact of pollution from all sources by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects, including: (a) by reducing excess nutrients lost to the environment by at least half, including through more efficient nutrient cycling and use; (b) by reducing the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management, based on science, taking into account food security and livelihoods; and (c) by preventing, reducing, and working towards eliminating plastic pollution."

These three different kinds of pollution occurring in Marin have prompted very different approaches to control, which in turn have met with different degrees of success. Because of prevailing northwesterly winds from the Pacific Ocean, air pollution from elsewhere normally does not have a large impact on Marin's biodiversity, with the big exception of greenhouse gas emissions, which are covered under Target #8. There may be no good measure of the total amount of the first two kinds, although there is better information on the third.

Pollution by excess nutrients has been addressed differently in urban/suburban and agricultural systems. In urban and suburban areas, efforts have been made to reduce un-permitted or leaking pipes, septic systems and outfalls to creeks and other waterways. Some reduction of excess nutrients from lawns and gardens has been achieved through educational programs and by incentives to remove lawns. In agricultural areas, major efforts have involved spreading manure growing pasture and composting wastes (https://www.rcdprojects.org/Project/Detail/12785) and (https://marincarbonproject.org/compost/)

Marin's large organic farming community makes a big contribution to reducing pesticide use. The County of Marin has an IPM Commission (https://apps.marincounty.gov/BosBoardsCommissions/BoardPage.aspx?BrdID=75&return=default.aspx) and a plan to use minimal pesticides on its lands. The real unknown in pesticide pollution is how much private homeowners are producing. The Marin Master Gardeners (https://ucanr.edu/site/uc-marin-master-gardeners) and the UC IPM Project (https://ipm.ucanr.edu/) offer information on reducing pesticide use.

Marin was an early leader in recycling (https://marinrecycling.com/), but the sad truth is that little if any plastic gets recycled. California's single-use plastics ban (https://calrecycle.ca.gov/plastics/carryoutbags/) may reduce plastic pollution to some extent, but how much is not yet clear. People from Marin have taken the lead in cleaning up plastic pollution in the Pacific Ocean (https://theoceancleanup.com/great-pacific-garbage-patch/). Zero Waste Marin (https://zerowastemarin.org) encourages repair and re-use of many articles, including plastic ones, and Sustainable Marin Schools (https://www.sustainablemarinschools.org/) attempts to model zero-waste practices for the next generation. Plastic-Free Marin provides important educational materials (https://plasticfreemarin.org/).

Canadian Comparison

What We Are Doing -- Areas of Action:

Nutrients
Pesticides and Nutrients
Pesticides
Chemicals
Plastics
Air pollutants
Going Further:

Amend, by 2025, the Pest Control Products Regulations to give the Minister of Health the explicit authority to: (1) require submission of available information on cumulative environmental effects, (2) require the consideration of cumulative effects on the environment of pesticides that have a common method of toxicity during risk assessments where information and methodology are available, and (3) require the submission of available information on species at risk.

Enhance protections for human health and the environment through HC's Continuous Oversight Approach to Regulating Pesticides. The policy adds new oversight processes such as the systematic scanning of published scientific literature, water monitoring data, and regulatory decisions made by other countries to further enable a modern regulatory program with 56 improved capacity to help ensure that risks associated with pesticides continue to be acceptable.

Provide guidance, through the Sustainable Agriculture Strategy, on pathways to improve environmental outcomes that further enhance the optimization of nutrient and pesticide application through beneficial management practices (BMPs) and precision agriculture technologies.

Enhance measurement of integrated pest management (IPM) by exploring opportunities to reduce data gaps related to on-farm use of pesticides, and BMP adoption.

Play a leadership role in negotiating an ambitious, legally binding international agreement to end plastic pollution. • *Finalize and implement a federal Ocean Noise Strategy.*

Implement prohibitions on disposal at sea of waste and other matter, dumping of fill, deposit of deleterious drugs and pesticides in most new federal marine protected areas, consistent with the Marine Protected Areas Protection Standard.

TARGET 8: CLIMATE CHANGE AND BIODIVERSITY

Minimize the Impacts of Climate Change on Biodiversity and Build Resilience

"Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solutions and/or ecosystem-based approaches, while minimizing negative and fostering positive impacts of climate action on biodiversity."

According to one calculation, Marin County has one of the highest ecological footprints on the planet, approximately five times the world average, and the largest part of it (62%) is the area required to absorb the carbon dioxide it produces (County of Marin 2007, p. 1.3-8). Fortunately, people in Marin have realized this and taken action to find ways and take action to reduce the contributions of its residence to climate change. In December 2020, Marin County produced its most recent Climate Action Plan (https://www.marincounty.gov/departments/cda/sustainability/climate-action-plan/climate-action-plan-2030), which describes the problem and proposes some measures for its solution. The plan was updated in 2024.

Unfortunately, as was mentioned repeatedly at the last biodiversity COP (COP16-Cali) and in the run-up to the last climate COP (COP30-Belém), something strange happened after the 1990 Earth Summit that launched modern global efforts to meet our ongoing environmental crisis. The major international conventions that this conference produced have become isolated from one another, "siloed" so to speak, contradicting the general understanding that our response to the crisis must be holistic. Fortunately, this problem is now recognized internationally, and suggestions on how to better integrate plans dealing with different aspects of our environmental crisis are being produced by the different COP's. One of these to expand the number of nature-based solutions and another is to increase the emphasis on native species in the nature-based solutions. Effective responses to changing climate generally fall into two categories, mitigation and adaptation, and a critical current need is to emphasize biodiversity in both. There are efforts in Marin to do this.

Several nature-based mitigation actions have been undertaken. These involve enhancing carbon sequestration in living plants and in the soil and reducing wildfire emissions by reducing the frequency and severity of wildfires. Many of these strategies are interconnected. A major new report that was released in 2026 explored these interconnections as it addressed the big question of what to do with biomass removed from lands in efforts to reduce wildfires (Marin Biomass Project 2026; https://www.marinrcd.org/marin-biomass-project). It describes current and alternative pathways of biomass disposal, analyzes their environmental and economic effects, and recommends future actions.

Plans to increase the total amount of carbon in living plant biomass have taken into account that this also increases the total amount of fuel that potentially could contribute to wildfires that are themselves increasing in severity due to climate change. The solution envisioned is to make sure that the location, spacing and size distribution of the resulting biomass makes it less likely to result in high-intensity fires. Forest rejuvenation projects such as that at Tomales Bay State Park (https://www.parks.ca.gov/pages/470/files/TomalesBay_PSA-Compl_WCAG_Final.pdf), although they initially reduce total biomass by thinning vegetation, will likely reduce total greenhouse gas emissions over the long term by reducing the risk of these high-intensity fires, sparing large trees and allowing them to continue to sequester more carbon, while also sparing animals and other wildlife that the forest supports. In the wildland-urban interface, shaded fuelbreaks being implemented by the Marin Wildfire Prevention Authority aim to have much the same effect (https://www.marinwildfire.org/project/shaded-fuel-break-planning-project).

In agricultural rural areas, carbon farming has been pioneered by the Marin Carbon Project, which aims to sequester carbon underground, in underground plant parts and in long-lasting soil components (https://marincarbonproject.org/); carbon farming has been greatly assisted by the Marin Resource Conservation District (https://www.marinrcd.org/carbon-farming-overview). Because such a large part of Marin is dominated by grassland ecosystems, and because most of these ecosystems have been greatly altered by introduction and spread of annual grasses from the Mediterranean region, sequestering carbon in deep-rooted California native perennial grasses and grassland soils potentially can have a great total impact on Marin's carbon balance. Other actions discussed under Target 2 (Restoration), such as increasing populations of native tree species along creeks, also have the effect of increasing carbon sequestration and biodiversity while not increasing wildfire risk in rural areas. In urban and suburban areas, efforts to improve defensive space around structures has led to the removal of much vegetation. Here, the Marin Chapter of the California Native Plan Society (CNPS) has seen a great opportunity. Because most of the plants being removed are exotic species of little habitat value for wildlife, the chapter has published lists of native species that can replace them, recommending that the new plantings adhere to fire-safe guidelines for spacing and maintenance (https://cnpsmarin.org/plant-replacement-list/). Cities and towns have yet to make significant progress in increasing the numbers of native tree and shrub species along streets, although the town of Corte Madera recently added more native species to its official street tree list (https://www.marinij.com/2025/05/12/corte-madera-revises-list-of-preferred-sidewalk-trees/).

Adaptation actions include preparing for sea-level change and setting priorities for areas of natural ecosystem conservation. The Bolinas Wye Wetlands Resiliency project (https://www.parks.marincounty.gov/projectsplans/wye-wetlands-bolinas-lagoon) aims to restore the connectivity of Lewis Gulch Creek and Bolinas Lagoon and allow for wetland migration adjacent to State Highway 1. On the other side of the county, on San Francisco Bay, conceptual plans have been discussed to protect wildlife while water levels increase at the Novato Baylands, including State Highway 37 (https://flooddistrict.marincounty.gov/novato-creek-baylands-strategy-plan/) (https://www.sfestuary.org/wp-content/uploads/2024/11/Agenda-7-Presentation_Novato-Baylands-Strategy.pdf). The current debate over whether to proceed with short-

term protection of the roadway with collateral damage to biodiversity or long-term protection of the roadway and biodiversity is representative of pressures affecting communities worldwide.

Several plans have evaluated the effects of climate change on natural communities and ecosystems. The Peak Health report of One Tam is one of these (https://www.onetam.org/peak-health). Another is the Climate Change Vulnerability Assessment of the Golden Gate Biosphere Network (https://ecoadapt.org/projects/35/Golden-Gate-Biosphere-Region-Climate-Adaptation-Project). Climate change models under three scenarios (warm, wet; warm, dry; and hot, wet) have been used to predict likely patterns of vegetation shift as well as where refugia of current kinds of vegetation are likely to occur. These predictions can help in application of the general RAD (Resist, Accept, Direct) strategies, because it makes most sense to prioritize conservation and restoration of ecosystems (Resist) in areas of refugia, while it more sense not to do this (Accept and Direct) in areas where great change seems very likely.

There is often overlap between mitigation and adaptation. For example, carbon sequestration and wildlife protection effects of forest health initiatives, while helping to mitigate climate change, may also help us adapt to the increased fire risk that climate change brings. Likewise, predictions of the effects of future climate change on distributions of ecological communities and ecosystems, while helping us to adapt to these changes, may also help to decide where mitigation actions might have the most impact.

Canadian Comparison

What We Are Doing -- Areas of Action:

Reducing greenhouse gas (GHG) emissions economy wide
Implementing nature-based solutions
Supporting ecosystem-based approaches
Advancing science and knowledge
Developing tools and capacity
Considering climate change and biodiversity effects in decision making

Going Further:

Continue enabling strong alignment between Canada's implementation of international commitments on climate change and nature under both the UN Framework Convention on Climate Change and CBD

Continue working to minimize the impacts of climate action on biodiversity across existing and new policies, programs, and legislation.

AREA 2 – MEETING PEOPLE'S NEEDS THROUGH SUSTAINABLE USE AND BENEFIT-SHARING

TARGET 9: SUSTAINABLE USE AND MANAGEMENT OF WILD SPECIES

Manage Wild Species Sustainably To Benefit People

"Ensure that the management and use of wild species are sustainable, thereby providing social, economic and environmental benefits for people, especially those in vulnerable situations and those most dependent on biodiversity, including through sustainable biodiversity-based activities, products and services that enhance biodiversity, and protecting and encouraging customary sustainable use by indigenous peoples and local communities."

At present, consumptive uses of wild species represent a small proportion of Marin's economy. Commercial logging ended decades ago, and commercial fishing, although locally important, is not as important as it used to be, largely because of declines in fish populations and subsequent restrictions on take (https://www.nationalfisherman.com/calif-salmon-season-reopens-but-commercial-fleet-faces-uncertainty; https://www.marinij.com/2026/07/14/salmon-fishing-resumes-off-california-coast-for-first-time-since-2022-heres-what-that-means/). Those fisheries that still provide the basis for the local industries are well-regulated by state and federal agencies.

There is the potential to increase traditional indigenous use of wild species. According to the agreement signed with Point Reyes National Seashore, the Federated Tribes of Graton Rancheria will be consulted on all management decisions. These could affect many species. The tule elk have been the focus of many discussions. Use of cultural fire to improve the productivity and form of plants used for basketry is another area of focus. The Coast Miwok Council of Marin has been particularly active in use of cultural fire (https://www.coastmiwokofmarin.org/about.html).

The main uses of wild species in Marin at present are non-consumptive, through tourism and recreation. Although non-consumptive uses have long been thought to pose little harm to wild species, this view has been changing. Data now exist showing that non-consumptive uses can indeed harm populations of wild species (Cole and Landres 1995; Knight and Cole 2012, Baas et al. 2020).

On the other hand, evidence is mounting on the importance of recreation and biodiversity to human and mental health (Louv 2008, Aerts et al. 2018). This became particularly evident during and after the lockdowns of the COVID19 pandemic, when recreational use of wild lands in Marin skyrocketed, contradicting previous predictions that virtual experiences would greatly supplant real ones.

Interestingly, when the Point Reyes National Seashore and the Golden Gate National Seashore were first established, national park service planners proposed more recreational development than local residents wanted, and ultimately scaled back these plans. Many years later, after regional population increases and the adoption and spread of a Marin invention, the mountain bike, the demand for recreational use has increased

The relatively new discipline of recreational ecology (Marion 2016) is establishing scientifically-based guidelines for sustainable recreation, and this should be able to inform future planning processes. Involvement of larger numbers of people in citizen science projects, discussed under Target #21, may have the effect of reducing the per-person impact of recreation. Involving indigenous peoples more fully in management of wild lands and diffusing more widely traditional beliefs and practices, may have similar effects. Another promising approach to relieving the pressure on existing wild lands is the "re-wilding" of urban and suburban lands, discussed further under Target #12.

In Marin, much of the discussion of how to protect biodiversity while allowing recreation has focused on trails, the main way that the public accesses wild lands. The County of Marin pioneered a collaborative process with the goal of balancing

access and protection (https://parks.marincounty.gov/projectsplans/memorial-trail-terra-linda/road-and-trail-management-plan-12-16-14). The Marin Municipal Water District has begun a new process to evaluate trails on Mt. Tamalpais (https://www.marinij.com/2026/03/16/mmwd-discusses-trail-options-on-mount-tamalpais/)

Canadian Comparison

What We Are Doing -- Areas of Action:

Pursuing the sustainable management of wild species that are culturally important to Indigenous Peoples
Supporting sustainable fisheries
Reducing impacts on non-target species
Implementing legislation and regulations
Revisiting federal legislation ensuring compliance with the United Nations Declaration on the Rights of Indigenous Peoples
Supporting Indigenous food security and capacity building, and Indigenous fisheries
Supporting meaningful participation & leadership of Indigenous Peoples and building capacity to manage & use wild spp.
Advancing science and research

Going Further:

Further expand the Harvesters Support Grant/Community Food Programs Fund, which will help ensure Indigenous Peoples can exercise harvesting rights (e.g., hunting, trapping, gathering, fishing) in the lands, waters, and ice, as they have for millennia, and support communities that have become isolated due to climate change.

TARGET 10: SUSTAINABLE MANAGEMENT IN KEY PRODUCTIVE SECTORS

Enhance Biodiversity and Sustainability in Agriculture, Aquaculture, Fisheries, and Forestry

"Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agro-ecological and other innovative approaches, contributing to the resilience and long-term efficiency and productivity of these production systems, and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services."

Marin has been a center of experimentation and innovation in improving sustainability in productive sectors. On land, this is visible in agriculture and horticulture. In the water, it can be seen in aquaculture and fisheries

Organic farms and gardens in Marin are in the forefront of testing and implementing sustainable practices in Marin
In 2023, there were 78 registered organic producers in Marin County, farming approximately 48,900 acres and producing an estimated gross value of $42,000,000. More than 97% of Marin's organically farmed acreage is pastureland (approximately 48,300 acres) (https://assets.marincounty.gov/marincounty-prod/public/2024-08/2023marincountycropandlivestockreport-final_r.pdf). Furthermore, Marin has its own local organic certification program, Marin Organic Certified Agriculture (MOCA) (https://www.marincounty.gov/departments/awm/agriculture/marin-organic-certified-agriculture-moca). In 2023, MOCA certified 46 operations as organic, including 13 dairies, 5 beef and 2 poultry operations, 13 fruit and vegetable operations, and 3 creameries.

Horticulture is also important in Marin, and its several native plant nurseries contribute to the sustainability of local gardens and landscapes; some produce their own plants. Marin has an active beekeeping community, with most of the hives belonging to small-scale beekeepers (https://marinbeekeepers.org/). Community gardens are additional important sites of organic and sustainable agriculture (https://ucanr.edu/site/uc-marin-master-gardeners/marin-community-gardens-map);

(https://ucanr.edu/sites/default/files/2012-04/141155.pdf). Information on sustainable practices is provided by Marin County Co-Operative Extension in many areas, including soils, water and pest and waste management (https://ucanr.edu/sites/default/files/2025-03/2024%20Marin%20County%20Annual%20Report.pdf0). Funding and guidance for sustainable practices is provided by the Marin Agricultural Land Trust and the Marin Resource Conservation District. Several initiatives underway on Marin ranch lands are described under Target #2 (Restoration) and Target #8 (Climate).

The Agricultural Institute of Marin (AIM) is an important nonprofit helping to connect local producers and consumers and thus strengthening the local food systems (https://www.agriculturalinstitute.org/). Its most visible activities are local farmers markets, but it also engages in education about local agriculture.

A relatively new program of Marin County is the Food, Agriculture and Resilient Ecosystems program (FARE), which grants funds from a local sales tax to promote community gardens, food access and other local food and agriculture initiatives (https://www.parks.marincounty.gov/projectsplans/fare-grants). One of its priorities is to help such initiatives in historically under-served communities, increasing food security.

Aquaculture is a significant enterprise in Marin, especially oyster production. Aquaculture produced 8% of total Marin agricultural revenue in 2024 (https://assets.marincounty.gov/marincounty-prod/public/2025-07/250626_2025%20Crop%20Report_FINAL_Web%20as%20spreads-tagged.pdf). In general, oyster reefs provide habitat for many other species, thus increasing biodiversity (https://www.fisheries.noaa.gov/national/habitat-conservation/oyster-reef-habitat). Efforts are underway to restore oyster reefs in San Francisco Bay. Although the most commonly farmed oyster is not native, shells from these oysters have been used to build reefs for native Olympia oysters (*Ostrea lurida*).

The crab fishery has experienced significant closures because of the need to avoid entangling migrating whales in the lines connecting the crab pots to the surface. However, the use of new “pop-up” traps may decrease this problem (https://usa.oceana.org/press-releases/california-expands-use-of-innovative-pop-up-fishing-gear-in-dungeness-crab-fishery/).

Canadian Comparison

What We Are Doing -- Areas of Action:

Agriculture
Aquaculture
Fisheries
Forestry

Going Further:

Complete development of a Sustainable Agriculture Strategy, to establish a long-term vision (to 2050) and approach to agri-environmental issues, with biodiversity as one of five priority areas, to, among other things, provide guidance on data challenges, improve opportunities for knowledge transfer, and leverage partnerships.

Develop a National Forest Resilience Strategy to better understand gaps and identify opportunities to increase positive outcomes for nature resilience and help inform innovative practices and decision making in Canada’s managed forests.

Ensure that Canada’s approach to defining sustainable forest management is consistent with Canada’s commitment to the KMGBF.

TARGET 11: ECOSYSTEM SERVICES AND FUNCTIONS

Restore, Maintain and Enhance Nature's Contributions to People

"Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as the regulation of air, water and climate, soil health, pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through nature-based solutions and/or ecosystem-based approaches for the benefit of all people and nature."

Many of the activities mentioned under other targets help to increase the contribution of ecosystem services. Carbon farming increases the ability of soils to store carbon and to retain soil nutrients. Reduction in pesticide use avoids killing off pollinators and predatory and parasitic insects. Urban greening with native species reduces the "heat island" effect, and in many other ways benefits the health of humans and other species that depend on them. Installation of horizontal levees using native species reduces damage from sea-level rise while increasing biodiversity.

A very important set of ecosystem services is threatened by uncontrolled wildfire; alternatively, resilience in the face of mounting wildfire threat may be considered an ecosystem service itself. The Marin Wildfire Prevention Authority (MWPA) in collaboration with several environmental groups in Marin, formed the Ecologically Sound Practices (ESP) Partnership (https://www.espmarin.org/) to formulate a set of practices to harmonize fire prevention efforts with protection of biodiversity. This resulted in the Ecologically Sound Practices for Vegetation Management report, approved in 2022 (https://static1.squarespace.com/static/61fd77d23318da3025673b51/t/62c4c9b2ef7632007440e58e/1657063871642/EcologicallySoundPractices_BoD_June2022_APPROVED.pdf_.

An innovative project designed to reduce nutrient pollution of the Civic Center Lagoon involved the construction of several floating islands planted with native plants (https://www.gallinaswatershed.org/civic-center-watershed-restoration) and (https://www.gallinaswatershed.org/do-the-wright-thing-at-the-marin-civic-center-lagoon). This was a collaboration between the County of Marin and the nonprofit Gallinas Watershed Council. The pilot project proved to be a success, and it may be implemented on a larger scale in the future.

Canadian Comparison

What We Are Doing -- Areas of Action:

Improving knowledge on ecosystem functions and services
Empowering Canadians to take action
Building resilience to impacts from climate change
Improving management of aquatic ecosystems
Restoring and enhancing ecosystem functions and services

Going Further:

Improve our understanding of the benefits that NBS and EbA initiatives provide to people and biodiversity by developing tools and guidance for assessing and reporting on benefits, including from Indigenous perspectives.

TARGET 12: URBAN GREEN AND BLUE SPACES

Enhance Green Spaces and Urban Planning for Human Well-Being and Biodiversity

"Significantly increase the area and quality, and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably, by mainstreaming the conservation and sustainable use of biodiversity, and ensure biodiversity-inclusive urban planning, enhancing native biodiversity, ecological connectivity and integrity, and improving human health and well-being and connection to nature, and contributing to inclusive and sustainable urbanization and to the provision of ecosystem functions and services."

There is growing recognition that urban and suburban spaces contain important relicts of original biodiversity and can play important roles in restoring biodiversity globally (Spotswood *et al*. 2021, Su *et al*. 2025). The link between urban biodiversity and human health is also drawing increased attention (Aerts *et al.* 2018). Beginning in 1973, the Marin Countywide Plan (https://assets.marincounty.gov/marincounty-prod/public/2026-02/cwplan_2023_updated_2026.pdf) rejected the idea that urbanization and other development would inevitably replace most of the natural areas in the county. This was a revolutionary idea at that time in a large, rapidly-urbanizing region. It specifically designated "corridors" based on land use, the coastal recreation corridor, the inland agricultural corridor and the eastern urban corridor. However, at that time, the understanding that all of these land use areas could contribute significantly to conservation and restoration was in its infancy and thus was not included in the plan. The only element of the plan that has been updated recently is the Housing Element, including the Form Based Code. This does implicitly recognize the importance of urban biodiversity in its specification for 70% native vegetation to be included in the landscaping of all new developments (https://assets.marincounty.gov/marincounty-prod/public/2024-08/form-base-code_8_24.pdf) (p. 61).

Establishment of parks and reserves close to cities and towns has increased conservation near them. The Golden Gate National Recreation Area is one example on the large scale of the San Francisco Bay Area, and it adjoins several cities and towns in southern Marin. On a smaller scale, the Marin Open Space Preserves are close to many more urban and suburban areas within Marin.

Of course, most land in cities and towns is privately owned, and this land has great conservation potential. Local Marin groups have been working to improve the percentage of native species (less than 1% in many neighborhoods) to at least the 70% standard. The Marin Chapter of the California Native Plant Society has led many of these efforts (https://cnpsmarin.org/). The Marin Monarch Working Group (https://www.marinmonarch.com/home-gardens), the Marin Resource Conservation District https://www.marinrcd.org/marin-rcd-story/), Home Ground Habitats (https://www.homegroundhabitats.org/) and the Marin Master Gardeners (https://ucanr.edu/site/uc-marin-master-gardeners/cal-native-plants)have also participated in this effort. An exciting initiative is that of Refugia Marin, an organization dedicated to improving native habitat on public land, including at local schools. It began as a single teacher's project in Corte Madera (https://www.refugiamarin.org/). At the other end of the county, the Pacheco Valle Biodiversity project began by improving habitat on a traffic island in Novato (https://pachecovallebiodiversity.com/). The Marin Biodiversity Corridor Initiative (MBCI) (marinbiodiversity.org) is a local effort to build on the Homegrown National Park (https://homegrownnationalpark.org/) idea so that the Urban Corridor of Marin can not only support enhanced biodiversity, but also help its restored habitats to serve as links among existing habitats in all parts of the county. An environmental justice challenge is how to guarantee access to urban biodiversity across all communities.

Many of Marin's rivers and streams flow through urban and suburban habitats. The County of Marin has a Stream Conservation Ordinance for the San Geronimo Valley (https://www.marincounty.gov/departments/cda/planning/planning-permits/dev-resources/sgv-community-standards/sca-sg-fact-sheet), and the Marin Resource Conservation District has an Urban Stream Program (https://www.marinrcd.org/urban-streams-program). Many watersheds within the county have nonprofit groups that work for their conservation and restoration. A few notable ones are Friends of Corte Madera Creek Watershed (https://friendsofcortemaderacreek.org/), Friends of Willow Creek (https://www.friendsofthecreek.org/) and

Gallinas Watershed Council (https://www.gallinaswatershed.org/). A 2022 Marin Creek Symposium revealed how fragmented ownership patterns in urban and suburban areas posed great challenges for unified watershed restoration. However, the partial restoration of the habitat on Lower Corte Madera Creek in late 2025 showed that concerted effort can overcome some of these (https://friendsofcortemaderacreek.org/projects/habitat-enhancement/). Other successful projects may be forthcoming.

Sea-level adaptation efforts have introduced local native oysters (*Ostrea lurida*) to some urban shorelines (https://marinmagazine.com/community/sustainability/marins-shifting-shoreline-how-local-organizations-are-adapting-our-habitat-to-live-with-sea-level-rise/).

Most agencies managing parks in Marin now have strong outreach programs to connect more people from urban areas to nature. These include the Golden Gate National Recreation Area (https://www.nps.gov/goga/learn/kidsyouth/index.htm), Point Reyes National Seashore (https://www.nps.gov/pore/learn/kidsyouth/index.htm), and Marin County Parks (https://parks.marincounty.gov/discoverlearn/events-calendar). Local non-profit organizations also lead field trips and conduct other activities in the parks. A unique program of Marin Parks provides grants to partner organizations that " help... bring underserved, high risk, and vulnerable community members to parks and preserves (https://parks.marincounty.gov/projectsplans/breathe-respira-grants). Twenty-seven grants were awarded the fiscal year 2025-2026.

Canadian Comparison

What We Are Doing -- Areas of Action:

Creating a network of national urban parks
Recognizing municipal protected and conserved areas
Supporting species at risk recovery in urban areas
Deploying NBS and natural infrastructure to support climate resilience
Demonstrating federal leadership on biodiversity and NBS
Providing data and information
Connecting people with nature

Going Further:

Work with PTs to explore opportunities to address barriers that limit the establishment of green and blue spaces, and urban park areas, through various options, including future Nature Agreements.

TARGET 13: SHARING GENETIC RESOURCES

Increase the Sharing of Benefits From Genetic Resources, Digital Sequence Information and Traditional Knowledge

Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and by 2030, facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments.

This has been one of the intensely-debated issues in most of the recent COPs. At the international level, it has pitted poorer, more biodiverse nations who are the sources of the genetic information that has led to many commercialized products against richer, less biodiverse nations who profit the most from the these products. If there is a local version of the international divide, it is undoubtedly the lack of access of local indigenous communities to their ancestral resources. One way this can be addressed is through negotiation and co-management agreements, as discussed under Target #3.

There are additional possibilities for improving equitable sharing of Marin's genetic resources.
Discussion of these possibilities started with the growing need for ecological restoration and the realization that current seed supplies are insufficient for the task (https://www.nationalacademies.org/news/2023/01/supply-of-native-seeds-insufficient-to-meet-the-needs-of-current-and-future-ecological-restoration-projects-says-new-report) and (https://www.nwf.org/Magazines/National-Wildlife/2024/Spring/Conservation/Native-Seed-Supply).

Because much of Marin is home to diverse native vegetation in diverse microhabitats, the intriguing possibility exists that this vegetation could be the source of diverse seed for more restoration efforts. The Golden Gate National Recreation Area (GGNRA) has long operated a series of nurseries that use locally-collected propagules for projects within the park (https://www.parksconservancy.org/programs/native-plant-nurseries). More recently, the County of Marin has begun similar efforts at its expanded county nursery (https://www.facebook.com/MarinCountyParks/videos/learn-about-our-native-plant-nursery/1258045985127851/). While these efforts have been very successful, the supply and diversity of native plants for projects outside these parks is limited. Future greater use of local genetic resources for such projects would require permitting and infrastructure beyond what is available now, but the Native Here nursery just across San Francisco Bay provides a good model for what might be done in Marin (https://nativeherenursery.org/). The College of Marin has examined the possibility of using the genetic resources of its campuses to produce locally-adapted plants for future landscaping projects.

Canadian Comparison

What We Are Doing -- Areas of Action:

Engaging in international efforts related to access and benefit-sharing (ABS)
Maintaining ex situ collections
Undertaking genomic surveillance

Going Further:

To further advance action on Target 13, the federal government may explore additional opportunities, including:

Providing greater clarity to users and providers of genetic resources, sharing best practices for ABS, and identifying and assessing additional measures that could allow Canada to become a Party to the Nagoya Protocol.

Developing guidance on research and commercial bioprospecting.

Enabling users of genetic resources and associated Indigenous Knowledge to share information on benefit-sharing and compliance actions to measure progress toward domestic and global targets.

AREA 3 – TOOLS AND SOLUTIONS FOR IMPLEMENTATION AND MAINSTREAMING

TARGET 14: MAINSTREAMING BIODIVERSITY VALUES

Integrate Biodiversity into Decision-Making at Every Level

"Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity, progressively aligning all relevant public and private activities, and fiscal and financial flows with the goals and targets of this framework."

This and the previous versions of this report are important steps forward in the mainstreaming of biodiversity values in Marin across all sectors. The show that biodiversity values have long been the motivation behind many different actions that have been taken by both government and non-governmental actors. Bringing all of this information together in one place is a prerequisite to future progress.

The Marin County Board of Supervisors took a step forward with the biodiversity presentations and resolution of August 20, 2024. It elevated the visibility of local actions that were already underway and made a significant commitment to building on this first step. Biodiversity values were already strong among many individual people who work within agencies and organizations in Marin, and the pathway is becoming clearer towards more explicit recognition within the county of the importance of biodiversity. Continuing along this path could result in Marin becoming recognized as a biodiversity leader.

The 2025 Marin County Fair focused on insects and other invertebrate animals (https://www.marincounty.gov/news-releases/marin-county-fair-announces-2025-theme-bug-tastic; https://www.marinij.com/2025/07/02/marin-county-fair-visitors-make-beelines-for-bug-exhibits/). Because these are the largest component of biodiversity worldwide, and because the fair attracted a large cross-section of the community, it played a unique role in the mainstreaming of biodiversity.

Discussions have begun at local levels across Marin on how best to incorporate biodiversity action into official policy. The College of Marin Board of Trustees adopted an important revision to its Board Policy on Environmental Responsibility (BP 6560) in 2025. Following the UN Making Peace With Nature report recommendation, this directs the college to "use the best available information to develop procedures that help (it) meet the three inter-related emergencies of biodiversity loss, climate change and pollution."

Canadian Comparison

What We Are Doing -- Areas of Action:

Integrating biodiversity considerations into decision making and activities
Building capacity to understand and measure biodiversity values
Working with others to promote biodiversity awareness, integration, and mainstreaming

Going Further:

Seek to strengthen accountability through its commitment to introducing a nature accountability bill in 2024, which, if passed into law, would establish an accountability and transparency framework—with meaningful checkpoints—to advance

implementation of the KMGBF at the federal level. (NOTE: This was introduced but defeated shortly before the 2025 election (https://www.endangeredecosystemsalliance.org/news/natureaccountability2025)

Take steps towards developing and implementing an Effects Management Framework to help mainstream biodiversity in regulatory decision making. Grounded on the principles of the mitigation hierarchy, adaptive management, and inclusion of Indigenous perspectives, this framework would enable consistent, risk-based considerations for managing the effects of human activities on biodiversity.

TARGET 15: BUSINESS' ROLE

Businesses Assess, Disclose and Reduce Biodiversity-Related Risks and Negative Impacts

"Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions:

(a) Regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity, including with requirements for all large as well as transnational companies and financial institutions along their operations, supply and value chains, and portfolios;

(b) Provide information needed to consumers to promote sustainable consumption patterns;

(c) Report on compliance with access and benefit-sharing regulations and measures, as applicable;

in order to progressively reduce negative impacts on biodiversity, increase positive impacts, reduce biodiversity-related risks to business and financial institutions, and promote actions to ensure sustainable patterns of production."

While much many of the institutions included in this target are national or transnational in scope, Marin County has taken steps to improve local policy. The clearest example may be the Re-usable Foodware Ordinance, adopted in 2022 and becoming effective in 2023 (https://www.marincounty.gov/departments/cda/env-health-svcs/foodware-ordinance). This helps to reduce the pollution produced by used disposable foodware items and also the pollution used in their production. The county helps local businesses with its implementation.

On their own, many Marin businesses have oped to purchase products certified to have smaller negative effects on biodiversity. Some of these certifications include those of the Green Building Council, the Forest Stewardship Council and the different organic food and sustainable seafood organizations. Although not specifically focusing on biodiversity, the Marin Conservation League (MCL) has for many years awarded the annual John McPhail Green Business Award to recognized local businesses that are leaders in environmentally-responsible practices.

<u>*Canadian Comparison*</u>

What We Are Doing -- Areas of Action:

Leveraging the work of international bodies developing frameworks and standards
Supporting climate related disclosure in Canada

Going Further:

To further advance action on Target 15a, the federal government will:

Seek advice from key partners, such as federal and provincial regulators, the private sector, Indigenous partners, and biodiversity experts on how the federal government could support the implementation of biodiversity-related disclosures through legal, administrative, or policy measures, and the implications of such disclosures for businesses, particularly small- and medium-sized enterprises.

Identify existing datasets and information relevant to financial decision making, as well as existing monitoring, reporting, and verification processes that could be leveraged for, or streamlined with, biodiversity-related disclosure (e.g., reporting standards, sustainability assessments, third-party certification schemes, due diligence initiatives).

Encourage international and domestic standard setters, such as the International Sustainability Standards Board and the Canadian Sustainability Standards Board, to develop nature-related financial disclosure standards and work with Canadian Crown corporations toward potential future adoption of the standards once they are complete.

TARGET 16: SUSTAINABLE CONSUMPTION

Enable Sustainable Consumption Choices To Reduce Waste and Overconsumption

Ensure that people are encouraged and enabled to make sustainable consumption choices, including by establishing supportive policy, legislative or regulatory frameworks, improving education and access to relevant and accurate information and alternatives, and by 2030, reduce the global footprint of consumption in an equitable manner, including through halving global food waste, significantly reducing overconsumption and substantially reducing waste generation, in order for all people to live well in harmony with Mother Earth.

Most relevant policy is enacted at the state rather than the local level, but several local programs and projects have helped to increase access to sustainable consumption choices. One is the Re-Usable Foodware Ordinance discussed under Target #16. Another is the Grown in Marin program of Co-Operative Extension (https://ucanr.edu/site/grown-marin), which lets consumers know how to buy locally-grown food. Another is MCE, originally Marin Clean Energy, that allows subscribers to choose a "Deep Green" electricity alternative. Production of compost from local waste (https://westmarincompost.org/) offers another sustainable option for consumers as does recycling of computers and related e-waste (https://renewcomputers.com/). Other programs are discussed under Target #7.

Canadian Comparison

What We Are Doing -- Areas of Action:

Supporting the transition to a more circular economy
Advancing products policy
Improving environmental literacy
Undertaking science, research, and capacity building

Going Further:

To further advance action on Target 16/15b, the federal government will:

Develop a Food Loss and Waste Reduction Action Plan that outlines efforts to cut food waste in half by 2030 through a series of measures to drive system-wide collaboration and action.

Explore how to advance circularity and circular value chains from an agricultural perspective through a Sustainable Agriculture Strategy.

TARGET 17: BIOSAFETY/BIOTECHNOLOGY

Strengthen Biosafety and Distribute the Benefits of Biotechnology

"Establish, strengthen capacity for, and implement in all countries, biosafety measures as set out in Article 8(g) of the Convention on Biological Diversity and measures for the handling of biotechnology and distribution of its benefits as set out in Article 19 of the Convention."

Most relevant measures affecting progress toward this target are addressed at higher levels of government.

Canadian Comparison

What We Are Doing -- Areas of Action:

Performing regulatory reviews
Advancing science and research
Strengthening capacity for biosafety measures

Going Further:

Work to complete proposed amendments to the New Substances Notification Regulations (Organisms) to address issues identified as part of the update to CEPA.

Conduct a gap analysis of biosafety priorities within biotechnology research and review and collaborate with OECD Member countries with regards to research and guidance documents on safety in biotechnology.

Undertake an analysis of Canada's potential ratification of the Cartagena Protocol and pursue Canada's participation in horizon scanning in synthetic biology, particularly in the area of artificial intelligence.

Proactively share information with stakeholders on its biosafety approaches, its regulatory decisions, and the potential adverse impacts of the introduction of specific living organisms into the Canadian environment (e.g., Higher Organism Risk Assessment Framework, initiative on standards for containment measures of living organisms).

Enhance its communication and capacity-building efforts, notably by updating web content on biotechnology, developing and implementing a stakeholder engagement strategy, continuing to conduct compliance promotion activities, and conduct public webinars on various biosafety and biotechnology topics.

TARGET 18: NEGATIVE AND POSITIVE INCENTIVES

Reduce Harmful Incentives by at Least $500 Billion per Year, and Scale Up Positive Incentives for Biodiversity

“Identify by 2025, and eliminate, phase out or reform incentives, including subsidies, harmful for biodiversity, in a proportionate, just, fair, effective and equitable way, while substantially and progressively reducing them by at least $500 billion per year by 2030, starting with the most harmful incentives, and scale up positive incentives for the conservation and sustainable use of biodiversity.”
This target was also the result of intense international negotiation over several COPs, largely between the same blocs of nations involved in the development of Target #13, because the most biodiverse countries are usually poorer than the countries that profit most from destroying biodiversity. The $500 billion figure was the compromise that was reached.

However, methods of reducing harmful subsidies and increasing positive incentive can be implemented both globally and locally. Local positive incentives include the “cash for grass” programs of the local water districts (https://marinwater.org/waterefficiency/rebates-and-incentives/cash-for-grass-lawn-replacement-program/; https://nmwd.com/save-water/nmwd-water-conservation-rebates/#cash-for-grass) and the grants available to larger landowners for implementing conservation measures (https://www.marinrcd.org/conserving-our-watersheds-cow-program; https://malt.org/grants-program/).

Canadian Comparison

What We Are Doing -- Areas of Action:

Eliminating inefficient fossil fuel subsidies (IFFS)
Investing in nature-positive actions

Going Further:

By mid-2025, undertake foundational work to define incentives, including subsidies, compile an inventory of incentives from sectors and activities that may have an impact on biodiversity, and develop a framework to assess incentives for their impacts.

Build on current or planned initiatives to address negative incentives affecting biodiversity, seeking to harness synergies and enhance coherence with other initiatives. For example, once entered into force, the World Trade Organization’s Agreement on Fisheries Subsidies will help in addressing certain negative incentives in the marine fisheries sector.

By 2030, substantially and progressively reduce the value of incentives and subsidies with harmful impacts on biodiversity, starting with the most harmful, while scaling up positive incentives for the conservation and sustainable use of biodiversity through work on other targets. This work will include developing an implementation plan, with key partners, to eliminate, phase out, and/or reform incentives, in a proportionate, just, fair, effective, and equitable way.

TARGET 19: FINANCIAL RESOURCE MOBILIZATION

Mobilize $200 Billion per Year for Biodiversity From all Sources, Including $30 Billion Through International Finance

“Substantially and progressively increase the level of financial resources from all sources, in an effective, timely and easily accessible manner, including domestic, international, public and private resources, in accordance with Article 20 of the Convention, to implement national biodiversity strategies and action plans, mobilizing at least $200 billion per year by 2030, including by:

(a) Increasing total biodiversity related international financial resources from developed countries, including official development assistance, and from countries that voluntarily assume obligations of developed country Parties, to developing countries, in particular the least developed countries and small island developing States, as well as

countries with economies in transition, to at least $20 billion per year by 2025, and to at least $30 billion per year by 2030;

(b) Significantly increasing domestic resource mobilization, facilitated by the preparation and implementation of national biodiversity finance plans or similar instruments according to national needs, priorities and circumstances;

(c) Leveraging private finance, promoting blended finance, implementing strategies for raising new and additional resources, and encouraging the private sector to invest in biodiversity, including through impact funds and other instruments;

(d) Stimulating innovative schemes such as payment for ecosystem services, green bonds, biodiversity offsets and credits, and benefit-sharing mechanisms, with environmental and social safeguards;

(e) Optimizing co-benefits and synergies of finance targeting the biodiversity and climate crises;

(f) Enhancing the role of collective actions, including by indigenous peoples and local communities, Mother Earth centric actions and non-market-based approaches including community based natural resource management and civil society cooperation and solidarity aimed at the conservation of biodiversity;

(g) Enhancing the effectiveness, efficiency and transparency of resource provision and use"

This target was also the result of intense negotiation between blocs of countries, and the $200 billion figurer was an unsatisfactory compromise. At COP16, the figure of $7 trillion was repeatedly mentioned as the amount spent annually on nature destruction, with the implication that at least an equal amount should be made available for nature protection and restoration.

Government expenditures for nature protection and restoration in Marin are made at Federal, state and local levels. To get some idea of the total, to these would need to be added all of the private donations to the agency partner organizations and nonprofits dedicated to these activities. This is a bookkeeping challenge, but because as has been often said, budgets reflect values, it might be a challenge worth taking on.

A first step might just be to identify those areas of different budgets that deal with biodiversity. The national budget of Canada has been analyzed in this way (https://www.ateliersbiodiversite.org/en/post/federal-budget-2024-and-biodiversity-sectoral-funding-to-the-detriment-of-transformative-actions).

The next step would be to total up the expenditures. The City of Los Angeles did this and found that it dedicates 1.2% of its budget, roughly $110 million, to biodiversity initiatives, encompassing 117 projects and programs, and involving 40+ partners and 5 cooperating agencies (https://sanitation.lacity.gov/cs/groups/public/documents/document/y250/mdi0/~edisp/cnt024743.pdf.) (p. 58)

The next step might be to track these areas to see if they are increasing or decreasing. Given the worsening of our biodiversity crisis, the expectation should be that spending on biodiversity should increase. Because the calculation of its expenditures is part of its Biodiversity Index, Los Angeles plans to repeat the calculation after a number of years.

Canadian Comparison

What We Are Doing -- Areas of Action:

Delivering federal nature and biodiversity domestic funding
Mobilizing capital through green bonds
Implementing Canada's International Biodiversity Program
Contributing to the Global Environment Facility (GEF)
Delivering the nature-based solutions and biodiversity co-benefits component of Canada's climate finance

Going Further:

Continue to identify how it (the federal government) can better use its funding instruments and convening power to attract private sector resources for a whole-of-society effort to protect, conserve, and restore nature at the domestic and international levels.

TARGET 20: CAPACITY BUILDING

Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity

"Strengthen capacity-building and development, access to and transfer of technology, and promote development of and access to innovation and technical and scientific cooperation, including through South-South, North-South and triangular cooperation, to meet the needs for effective implementation, particularly in developing countries, fostering joint technology development and joint scientific research programmes for the conservation and sustainable use of biodiversity and strengthening scientific research and monitoring capacities, commensurate with the ambition of the goals and targets of the Framework."

In Marin, programs that further progress toward this goal may be found in educational institutions, public agencies, and independent organizations.

The College of Marin has long offered courses in identification and biology of most major groups of organisms. Furthermore, it operates the Science Museum on its Kentfield campus (https://www1.marin.edu/science-museum), the Organic Farm and Garden at its Indian Valley campus (https://www1.marin.edu/IVOFG) and a Field Station in Bolinas (https://baynature.org/2023/11/09/the-storied-bolinas-marine-laboratory-is-reborn/). Dominican University has a new habitat garden at its campus in San Rafael, which is now the site of biological inventory (https://www.dominican.edu/news/news-listing/ecology-class-focuses-research-local-insect-biodiversity). San Rafael High School's School of Environmental Leadership (https://thesel.org/) occasionally has projects involving biodiversity.

Point Reyes National Seashore is the site of the Clem Miller Environmental Science Center (https://www.nps.gov/pore/learn/education/additional-educational-resources.htm), the Point Reyes Field Institute (https://www.pointreyesnature.com/classes-webinars) and was the original site of the Point Reyes Birding and Nature Festival (https://www.pointreyesbirdingfestival.org/). Marin Parks has a regular program of guided walks (https://parks.marincounty.gov/discoverlearn/events-calendar).

Many environmental organizations offer field trips and workshops in Marin. These include Marin Audubon (https://marinaudubon.org/activities/field-trips/), the Marin Chapter of the California Native Plant Society (https://cnpsmarin.org/natives-in-the-wild/field-trips/), All Hands Ecology (https://www.allhandsecology.org/nature-experiences/) and the Mycological Society of San Francisco (https://www.mssf.org/).

Canadian Comparison

What We Are Doing -- Areas of Action:

Partnering with other countries for the conservation and sustainable management of global biodiversity
Undertaking bilateral technical cooperation on biodiversity
Integrating biodiversity considerations into international climate finance
Contributing to the Global Environment Facility (GEF)

Going Further:

Supporting and sharing information and lessons learned with international partners on KMGBF implementation. Strengthening collaboration between stakeholders to increase the effectiveness of existing actions, expand their reach, and ensure that they directly target identified capacity-building needs.

TARGET 21: KNOWLEDGE SHARING

Ensure That Knowledge Is Available and Accessible To Guide Biodiversity Action

"Ensure that the best available data, information and knowledge are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity, and to strengthen communication, awareness-raising, education, monitoring, research and knowledge management and, also in this context, traditional knowledge, innovations, practices and technologies of indigenous peoples and local communities should only be accessed with their free, prior and informed consent, in accordance with national legislation."

There does not seem to be one site where all biodiversity information gathered in Marin can be found. However, public agencies and institutions have links on their individual websites to information relevant to the lands and waters they manage. Furthermore, a consortium of public entities has established the MarinMap geographic information system (GIS) for Marin (https://www.marinmap.org/dnn/default.aspx). This could one day provide a central platform for biodiversity information within the county boundaries.

Marin and the San Francisco Bay Area have been one center for the development of citizen or community science in the United States (Hannibal 2016). Many different agencies organizations conduct bioblitzes (Eaton 2014, da Silva 2018), longer-term monitoring and other similar scientific research activities that are open to the public. One Tam, in particular, sponsors several ongoing community science programs (https://www.onetam.org/volunteer). Citizen science projects both collect biodiversity information and diffuse it to members of the public.

Canadian Comparison

What We Are Doing -- Areas of Action:

Collecting and publishing data and information
Supporting Indigenous Knowledge systems and data sovereignty
Synthesizing and sharing existing knowledge and generating new knowledge
Raising awareness

Going Further:

Assemble and publish an online compendium of biodiversity resources to facilitate access to trusted sources of data and information.

TARGET 22: INCLUSIVITY

Ensure Participation in Decision-Making and Access to Justice and Information Related to Biodiversity for all

"Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by indigenous peoples and local communities, respecting their cultures and their rights over lands, territories, resources, and traditional knowledge, as well as by women and girls, children and youth, and persons with disabilities and ensure the full protection of environmental human rights defenders."

A 2020 study that ranked Marin as the most segregated county in the San Francisco Bay Area called attention to a historical lack of inclusivity (https://belonging.berkeley.edu/most-segregated-cities-bay-area-2020). The existence of ongoing problems of environmental justice (https://a2coalition.org/marin-city-climate-resilience-and-health-justice/; https://www.marincityclimateresilience.org/about; https://www.cityofsanrafael.org/climate-resilience-and-environmental-justice/) is a legacy of unequal participation in decision-making that goes back many years. However, although there are efforts to minimize unequal effects of impending sea-level rise, little information is available about efforts at the neighborhood level to minimize effects of unequal biodiversity. General efforts described under Target #12 should help to bring biodiversity to more people in Marin's eastern urban corridor, but information comparing biodiversity of neighborhoods, as exists for Los Angeles, appears to be lacking in Marin.

National data on visitors to parks and preserves many years ago revealed that they were not representative of the general population. This led to the "parks to the people' idea that led to the establishment of the Golden Gate National Recreation Area in 1972, as well as to current NPS efforts to increase visitation by under-represented groups. A new program in 2026 made beach wheelchairs available to those who could benefit from the (https://www.marinij.com/2026/03/09/west-marin-resident-returns-to-local-beaches-after-traumatic-brain-injury/). Marin Parks has a similar program involving a "terrain hopper" (https://parks.marincounty.gov/discoverlearn/terrainhopper). It also has made important efforts to increase access to parks and preserves by multiple disadvantaged sectors of the population, including a grant program launched in 2019 (https://www.marincounty.gov/news-releases/parks-grants-designed-inspire-visitor-diversity).

Bringing people from traditionally-underrepresented communities into employment by agencies that manage biodiversity is an important way to include them in decision-making about it. Many agencies that manage or conduct operations on wild lands in Marin have made efforts to diversify their workforces. The Fire Foundry partnership with the College of Marin is one example of such an effort (https://www.firefoundry.org/). Co-management agreements described under Target #3 should increase participation in decision-making by indigenous people.

Canadian Comparison

What We Are Doing -- Areas of Action:

Advancing reconciliation
Supporting Indigenous-led conservation and stewardship
Ending violence against Indigenous women, Indigenous girls, and Indigenous 2SLGBTQI+ individuals
Enhancing equitable consideration of Indigenous Knowledge in impact assessments
Engaging with Indigenous Peoples on national biodiversity policy
Ensuring a diverse Canadian Delegation at international fora
Engaging with youth on biodiversity and nature
Upholding the rights of persons with disabilities

Making national parks accessible

Going Further:

Work on new approaches to funding that would enable federal departments to work toward a one-window strategic partnership approach for external partners, including Indigenous Peoples, to support the implementation of the 2030 Strategy.
Review the CBD's Gender Plan of Action and assess how best to meet the objectives of this plan that are relevant in Canada and promote full, equitable, inclusive, and effective participation of Indigenous women, Indigenous girls, and Indigenous 2SLGBTQI+ individuals in biodiversity decision-making processes.

TARGET 23: GENDER EQUALITY

Ensure Participation in Decision-Making and Access to Justice and Information Related to Biodiversity for all

"Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by indigenous peoples and local communities, respecting their cultures and their rights over lands, territories, resources, and traditional knowledge, as well as by women and girls, children and youth, and persons with disabilities and ensure the full protection of environmental human rights defenders."

One of the principal environmental organizations in Marin, the Marin Conservation League, was founded by four women (https://marinmagazine.com/community/history/the-inspirational-beginnings-of-the-marin-conservation-league/). Indeed, a unique feature of the conservation history of the San Francisco Bay Area is that women originated and led many of the major campaigns. As eminent regional geographer Richard Walker has put it: "The primary role of women in this history is striking" However, he also quickly added, "Yet women are all but invisible in traditional environmental history (Walker 2007, pp. 8-9). Women in Marin as elsewhere have had to struggle for equality. It would be most useful to have more specific information about the biodiversity aspects of this struggle.

Canadian Comparison

What We Are Doing -- Areas of Action:

Implementing Gender- Based Analysis (GBA) Plus
Upholding commitments in the 2022 to 2026 Federal Sustainable Development Strategy (FSDS)
Implementing the Feminist International Assistance Policy (FIAP)
Supporting international implementation of the KMGBF
Using other foundational federal tools, plans, and initiatives

Going Further:

Continue to facilitate the adoption of relevant actions in the Gender Plan of Action in both national and international contexts and continue to encourage other countries to do the same with the aim of better integrating gender considerations in global and national biodiversity plans and policies.

Seek to strengthen and align existing federal approaches to gender-responsive and gender transformative strategies to support and inform gender equality in biodiversity fora.

CONCLUSION

This is the only existing report with that summarizes biodiversity work in Marin according to the 2030 targets of the Kunming-Montreal Global Biodiversity Framework (GBF). Its format allows comparison with other biodiversity reports from all over the world. The information presented here reveals the good news that much progress has been made in some areas (e.g. Targets #2 and #3). It gives cause for concern in other areas, but also points out that it is in exactly these areas that future work may have the biggest impact (e.g. Targets #1, #4 and #14). In the context of the deepening worldwide crisis, the big questions are, 1) "Is this progress enough?" and 2), "If, not, what do we do next?" At COP17 (https://www.cbd.int/conferences/2026), the entire world will be asking the same questions. Information from the Marin members of the California delegation to the COP will bring some answers back that should help to inform further work in Marin.

Another finding of this report is that subnational areas and governments may need to craft strategies a little different from national governments. Although most of the targets of the GBF are relevant at lower levels, a few of them pertain only to national governments with broad regulatory powers. As a complement to the GBF, subnational governments and areas may find it useful to adopt some version of the Cities' Biodiversity Index to guide their biodiversity work (https://www.nparks.gov.sg/docs/default-source/resources/2021/handbook-singapore-index-cities-biodiversity.pdf), as the City and County of Los Angeles have done.

All who have contributed to this report hope that it will be used as a valuable information base by all responsible entities in Marin - the county, its cities, its towns, and its special districts – as they enact policies and take actions urgently needed to benefit current and future generations. Actions of the County of Los Angeles, the City of Mountain View and the Marin Community College District are examples of what is possible.

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