

Natural Resources Conservation... Now What?

Quick Facts: Conservation Scientists and Foresters	
2020 Median Pay	\$64,010 per year
Typical Entry-Level Education	Bachelor's degree
Work Experience in a Related Occupation	None
On-the-job Training	None
Number of Jobs, 2018	36,100
Job Outlook, 2018-28	5% (Faster than average)
Employment Change, 2018-28	1,700

<https://www.bls.gov/ooh/life-physical-and-social-science/conservation-scientists.htm>

What Is Natural Resources Conservation?

Conservation biology has focused on the scientific study of the nature and of Earth's biodiversity, with the aim of protecting species, their habitats, and ecosystems from excessive rates of extinction. Today's conservation science incorporates conservation biology into a broader interdisciplinary field that explicitly recognizes the tight coupling of social and natural systems. Natural Resources Conservation is a multi-disciplinary field that integrates rigorous academic training in the natural, conservation, and social sciences, with hands-on field skills, towards the goal of bettering natural resource management.

As human populations increase and natural resources and habitats become more limited, there is a critical need for trained conservation professionals in natural resources conservation. Natural conservation scientists study the ecology of terrestrial and aquatic ecosystems, and how these systems can best be managed to conserve biodiversity, protect ecosystem functions, *and* provide sustainable benefits to humans in society. Emerging priorities include pursuing conservation within working landscapes, rebuilding public support, working with the corporate sector, and paying better attention to human rights and equity.

What Do Conservation Scientists And Foresters Do?

Conservation scientists and foresters typically do the following:

- Monitor forestry and conservation activities to assure compliance with government regulations
- Establish plans for managing forest lands and resources
- Supervise activities of other forestry and conservation workers

- Choose and prepare sites for new trees using controlled burning, bulldozers, or herbicides to clear land
- Negotiate terms and conditions for forest harvesting and land-use contracts
- Direct and participate in forest-fire suppression
- Determine ways to remove timber with minimum environmental damage
- Monitor forest-cleared lands to ensure that they are suitable for future use

Conservation scientists manage, improve, and protect the country's natural resources. They work with landowners and federal, state, and local governments to devise ways to use and improve the land while safeguarding the environment. Conservation scientists advise farmers, farm managers, and ranchers on how they can improve their land for agricultural purposes and control erosion.

Foresters have a wide range of duties, and their responsibilities vary depending on their employer. Some primary duties of foresters include drawing up plans to regenerate forested lands, monitoring the progress of those lands, and supervising tree harvests. They also come up with plans to keep forests free from disease, harmful insects, and damaging wildfires. Foresters may choose and direct the preparation of sites on which trees will be planted. They advise on the type, number, and placement of trees to be planted. When the trees reach a certain size, foresters decide which trees should be harvested and sold to sawmills.

Conservation scientists and foresters evaluate data on forest and soil quality, assessing damage to trees and forest lands caused by fires and logging activities. In addition, they lead activities such as fire suppression and planting seedlings. Fire suppression activities include measuring how quickly fires will spread and how successful the planned suppression activity turns out. Scientists and foresters use their skills to determine a fire's impact on a region's environment. Communication with firefighters and other forest workers is an important component of fire suppression activities because the information that conservation scientists and foresters give can change how firefighters work.

Conservation scientists and foresters use a number of tools to perform their jobs. They use clinometers to measure the heights of trees, diameter tapes to measure a tree's circumference, and increment borers and bark gauges to measure the growth of trees so that timber volumes can be computed and growth rates estimated. In addition, conservation scientists and foresters often use remote sensing (aerial photographs and other imagery taken from airplanes and satellites) and geographic information systems (GIS) data to map large forest or range areas and to detect widespread trends of forest and land use. They make extensive use of hand-held computers and global positioning systems (GPS) to study these maps.

The following are some types of conservation scientists and foresters:

Procurement foresters buy timber by contacting local forest owners and negotiating a sale. This activity typically involves taking inventory on the type, amount, and location of all standing timber on the property. Procurement foresters then appraise the timber's worth, negotiate its purchase, and draw up a contract. The forester then subcontracts with loggers or pulpwood cutters to remove the trees and to help lay out roads to get to the timber.

Other foresters, mostly in the federal government, study issues facing forests and related natural resources. They may study issues such as tree improvement and harvesting techniques, global climate change, improving wildlife habitats, and protecting forests from pests, diseases, and wildfires.

Urban foresters live and work in larger cities and manage urban trees. They are concerned with quality-of-life issues, including air quality, shade, and storm water runoff.

Conservation education foresters train teachers and students about issues facing forest lands.

Two of the most common types of conservation scientists are range managers and soil conservationists.

Range managers, also called range conservationists, protect rangelands to maximize their use without damaging the environment. Rangelands contain many natural resources and cover hundreds of millions of acres in the United States, mainly in the western states and Alaska. Range managers may inventory soils, plants, and animals; develop resource management plans; help to restore degraded ecosystems; or help manage a ranch. They also maintain soil stability and vegetation for uses such as wildlife habitats and outdoor recreation. Like foresters, they work to prevent and reduce wildfires and invasive animal species.

Soil and water conservationists give technical help to people who are concerned with the conservation of soil, water, and related natural resources. For private landowners, they develop programs to make the most productive use of land without damaging it. They also help landowners with issues such as dealing with erosion. They help private landowners and governments by advising on water quality, preserving water supplies, preventing groundwater contamination, and conserving water.

What Can I Do With A Degree In Natural Resources Conservation?

Animal Nursery Worker	Conservation Program	Environmental Educator
Arborists & Urban Foresters	Manager	Environmental Lawyers
Civil Engineering Technician	Conservation Scientist	Environmental Science
Community Organizer	Conservation Technician	Technician
Conservation Law	Elementary / High School	
Enforcement Officers –	Science Teacher	Environmental Specialist

Fish/Game Warden
Forest Firefighter
Forest/Wildlife Detective
Forestry Worker
Fundraiser
GIS/Mapping Technician
Land Planner
Landscape Architect
Naturalists and
Environmental Educators

Outdoor Recreation
Specialists
Park Managers and Rangers
Permit Coordinator
Plant Ecologist
Professional Foresters and
Plant Ecologists
Public Relations Specialist
Real Estate Inspector
Regulatory Affairs Specialist
Restoration Specialist

Science Writer
Soil Scientist
Systems Ecologist
Water and Land Use Planners
Water Resource Technician
Watershed Scientist
Wildlife and Fisheries
Technicians
Wildlife Biologist
Wildlife Manager
Zoologist

Who Might I Work For?

About 75% of conservation scientists work for federal, state or local governments.

County Soil and Water
Conservations Districts
Environmental Consulting
Firms
Forestry Companies
Green Builders
Land Brokers
Land Management Agencies
Land Surveying Firms
Lobbying Firms

Municipal Water Depts
National Forest Service
Nat'l Oceanographic &
Atmospheric Admin
Parks Service (National,
State, private)
Schools & Colleges
Social Advocacy
Organizations
State / Local Govt Agencies

United States Geological
Survey (USGS)
US Department of Energy
(DOE)
US Environmental Protection
Agency (EPA)
US Fish & Wildlife
USDA Resource Conservation
Service
Watershed Districts

Where Might I do an Internship?

UMass Amherst Natural Resource Conservation Majors Have Done Internships At The Following Sites:

Amherst (Town of)
Bayshore Discovery Project
Bioshelters Inc.
Denali Lodges
Elephants Without Borders
Flynn Associates
Global Vision International
Hitchcock Center for the
Environment
MA Dept. of Environ. Mgmt.

Mass Public Interest
Research Group (MassPIRG)
Perkins School for the Blind
Smith Barney
Southwick Conservation
Commission
UMass Amherst Athletic
Media Relations
UMass Amherst Campus
Sustainability Initiative

UMass Amherst Nat Res
Conservation Dept
US Army Corps of Engineers
US District Court - District of
Connecticut
US Fish & Wildlife Service
UTC Power
Walt Disney World

Career Planning Resources & Websites (* = of particular note)

- * UMass Amherst Career Services Events Calendar www.umass.edu/careers
- * UMass Amherst Dept of Environmental Conservation <http://eco.umass.edu/career-opportunities>
- * UMass Amherst Sustainability Science Masters Program <http://eco.umass.edu/degree-programs>
- * Finding Independent Lab Research On Campus www.umass.edu/biochem/undergraduate/lab
- FOCUS2 Career and Education Planning www.umass.edu/careers/planning for sign-in button
- What Can I Do With This Major? <https://www.umass.edu/careers/planning>

(Click on "What Can I do with this Major" icon on the right-hand column.)

Bureau of Labor Statistics Occupational Outlook Handbook <http://data.bls.gov/search/query>

Massachusetts Career Information System <http://masscis.intocareers.org>

(Click Mass Resident to login with "Amherst/01003" Then click "Occupations" or "Assessments")

Career Planning Resources & Websites (cont.)

- 10 Essential Skills for Conservationists www.jamesborrell.com/10-essential-skills
- Conservation Careers and Internships (Intl. too) www.conservation-careers.com
- Forestry & Natural Resources Links <http://forestrycareers.org/links.html#careers>
- Forestry Sub-Disciplines http://forestrycareers.org/sub_disciplines.php
- How to Get a Job in Conservation and Love It www.jamesborrell.com/how-to-get-a-job-in
- Huge List of Environmental Careers www.khake.com/page46
- Huge List of Oceanography and Marine Sci Careers <http://peterbrueggeman.com/ocean/career>
- Reports on Jobs in the Growing Green Economy www.findingearthworks.org/resources.htm
- Riley Guide: Careers in Earth, Water, & Environ Sci www.rileyguide.com/env.html
- UC Berkeley Career Center "Environment" <http://career.berkeley.edu/Environment>

Natural Resources Job and Internship Search Resources (* = of particular note)

UMass Amherst Specific Job Search Resources

- * UMass Handshake Database of Internships & Jobs <https://umass.joinhandshake.com/>
- * UMass Amherst Dept of Environmental Conservation <http://eco.umass.edu/for-current-students>
- * UMass Amherst Local Sustainability Jobs/Internships www.umass.edu/sustainability/resources
- Job Seeker Environmental Jobs Newsletter www.umass.edu/careers/jobsearch/listings

(If listed password has expired, call Career Services for current password)

Natural Resources Conservation

- Appalachian Mountain Club www.outdoors.org/employment
- Chicagoland Environmental Network www.chicagoenvironment.org/jobintern
- Conservation International (US & Intl) <https://www.conservation.org>
- Conservation Job Board www.conservationjobboard.com
- Cool Works Jobs in Great Places www.coolworks.com
- Earthworks Jobs By Category <http://earthworks-jobs.com>

Eco Employ www.ecoemploy.com
Elements (Mineralogy / Geochemistry / Petrology) <http://elementsmagazine.org/job-postings/>
Environmental Careers Organization (eco.org) www.eco.org
* Environmental Career (post resume & apply through) <https://environmentalcareer.com/>
Environmental Career Opportunities (ECO) <http://www.ecojobs.com/>
Environmental Jobs and Careers (aggregator site) www.ejobs.org
Environmental Jobs <http://environmentaljobs.com>
Farm & Ranch Jobs (by State) www.farmandranchjobs.com

Natural Resources Conservation (cont.)

General Science Jobs (widely defined) <http://jobs.sciencecareers.org>
General Science Jobs (widely defined) <http://jobs.newscientist.com>
Green Collar Blog: Job Boards and Job Fairs www.ejobs.org/states
Green Dream Jobs www.sustainablebusiness.com
* Green Drinks Springfield (hub of local communities) www.facebook.com/GreenDrinksSpringfield
* Green Jobs (store resumes & apply through site) <http://greenjobs.com/jobseekers>
Green Job Search <http://www.greenjobsearch.org/>
GreenBiz Jobs Board <http://jobs.greenbiz.com>
Global Vision International Careers Abroad www.careersabroad.co.uk/vacancies
* Idealist -- Opportunities for Action www.idealist.org
* LinkedIn Green Job and Career Network www.linkedin.com/groups?gid=77194
* Mass Clean Energy Center Jobs Board www.masscec.com/work-clean-energy/jobs
* Massachusetts (State) Environmental Agencies www.mass.gov/eea/agencies
National Environmental Health Assoc Job Board www.neha.org/job_center.html
National Park Service Jobs www.nps.gov/aboutus/workwithus.htm
NatureJobs (widely defined) www.nature.com/naturejobs/science
NYC & Intl Wildlife Conserv Society Jobs & Internships <https://www.wcs.org/>
Sierra Club Jobs (mostly in Cali and DC) <https://www.sierraclub.org/careers>
* Texas A&M Wildlife & Fisheries Jobs Board (some intl) <http://wfscjobs.tamu.edu/job-board>
Water Industry Jobs www.waterjobsnow.com
Water Environment Federation (WEF) Job Bank <http://jobbank.wef.org/jobseekers>
World Wildlife Federation Jobs http://www.wwf.panda.org/who_we_are/jobs
USDA Natural Resources Conservation Service www.nrcs.usda.gov/wps/portal/nrcs
* USDA Natural Resources Conservation (by State) www.nrcs.usda.gov/wps/portal/nrcs
* US Environmental Protection Agency (EPA) Jobs www.epa.gov/careers
* USA Jobs (for ALL Federal Govt Jobs) www.usajobs.gov
* Yale's List of Environmental Jobs Sites <http://environment.yale.edu/careers>

Internships and Field Research in Conservation Science

* CareerConnect Database of Internships & Jobs www.umass.edu/careers for sign-in button
* UMass Amherst Dept of Environmental Conservation <http://eco.umass.edu/for-current-students>

Columbia List of Summer Internships in Ecology	http://www.columbia.edu/cu/biology/ug
American Geological Institute (Geosci & Public Policy)	www.americangeosciences.org
Campus Access List of Environmental Internships	www.campusaccess.com/internships
Chicagoland Environmental Network	www.chicagoenvironment.org/jobintern
Cool Works Internships	www.coolworks.com/internships
Ecological Society of America: Fieldwork Internships	www.esa.org/esa/careers

Internships and Field Research in Conservation Science (cont.)

Environmental Organizations by Category	www.webdirectory.com
Global Vision Intl Careers Abroad: Internships	www.careersabroad.co.uk/internships
Internships in Federal Government Agencies (EPA etc)	www.usajobs.gov/Search?Internship=Yes
List of Sites with Natural Resources Internships	www.rnrf.org/intern.html
MassCEC Paid Internships Program	http://www.masscec.com/work-clean-energy/job-seeker/internship-program
MassCEC Resume Board	http://www.masscec.com/work-clean-energy/resumes
National Park Service Internships (nationwide)	www.nps.gov/aboutus/jobsforstudents.htm
NYC Parks and Recreation Internships	www.nycgovparks.org/opportunities
Northwest Connections	www.northwestconnections.org/internships
Sierra Club	www.sierraclub.org/sierra/internships
* Student Conservation Association (SCA)	www.thesca.org
Worldwide Opportunities on Organic Farms (WWOOF)	www.woof.net

Professional Organizations (* = of particular note)

Many professional organization's websites have career information on them. You can often use them to search for networking events, meet a mentor in your field of study, find current research, search for internships or jobs, and gain insight into what direction within the field you may wish to pursue.

American Water Works Association	www.awwa.org
Assoc for Advancement of Sustainability in Higher Ed	www.aashe.org/resources
Assoc for Environmental Studies and Sciences	https://aessonline.org/
Ecological Society of America	www.esa.org
List of Minority Professional Organizations	www.nrcs.usda.gov/wps/portal/nrcs
Local Govt Environmental Assistance Network	www.lgean.org (has grants & funding opps)
*Mass. USDA Natural Resources Conservation Service	www.nrcs.usda.gov/wps/portal/nrcs
Minorities in Natural Resource Conservation (MINRC)	www.minrc.org
Natl Assoc for Environmental Professionals (NAEP)	www.naep.org
Renewable Natural Resources Foundation	www.rnrf.org
Society for Conservation Biology	www.conbio.org
Society of Wetland Scientists	http://sws.org
Society for Range Management	www.rangelands.org
* UMass Amherst Eco Dept Student Societies & Groups	http://eco.umass.edu/for-current-students
U of Michigan List of Professional Organizations	http://seas.umich.edu/careers

US Environmental Protection Agency	www.epa.gov
USDA Natural Resources Conservation Service	www.nrcs.usda.gov/wps/portal/nrcs
* Western Mass Green Consortium	http://westernmassgreenconsortium.org
Wildlife Conservation Society (WCS)	www.wcs.org/about-us/careers.aspx
* Yale's List of Additional Professional Organizations	http://environment.yale.edu/careers/resources

Other Environmental and Conservationist Resources

Envirolink	www.envirolink.org
Environmental News Network	www.enn.com
Greenfield Farm and Food Systems Classes	www.gcc.mass.edu/academics
Journal of Young Investigators (Undergrad Research)	www.jyi.org
NESEA Sustainable Green Pages (for Northeast)	http://nesea.org/greenpages
US Dept of Labor Women's Guide to Sustainable Careers	www.dol.gov/wb/Green_Jobs_Guide

Important Transferable Qualities To Include On Your Resume

Analytical skills. Conservation scientists and foresters must evaluate the results of a variety of field tests and experiments, all of which require precision and accuracy.

Critical-thinking skills. Conservation scientists and foresters reach conclusions through sound reasoning and judgment. They determine how to improve forest conditions, and they must react appropriately to fires.

Decision-making skills. Conservation scientists and foresters must use their expertise and experience to determine whether their findings will have an impact on soil, forest lands, and the spread of fires.

Interpersonal skills. Conservation scientists and foresters need to work well with the forest and conservation workers and technicians they supervise, so effective communication is critical.

Physical stamina. Conservation scientists and foresters often walk long distances in steep and wooded areas. They work in all kinds of weather, including extreme heat and cold.

Speaking skills. Conservation scientists and foresters must give clear instructions to forest and conservation workers and technicians, who typically do the labor necessary for proper forest maintenance.

What Do Employers Look For? (NACE 2020 Job Outlook for Students)

