

**Forest Service Handbook
National Headquarters - Washington Office
Washington, DC**

**Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health**

Amendment: 6709.11-2018-1

Effective date: December 03, 2018

Duration: This amendment is effective until superseded or removed.

Approved by: Robert Velasco II, Acting Deputy Chief, Business Operations

Date approved: November 28, 2018

Responsible Staff:

Last Change: 6709.11-2016-1 to 6709.11_20

Superseded Document(s): Entire Handbook; 6709.11, Contents, Amendment 6709.11-99-1, December 01, 1999; 6709.11_zero_code, Amendment 6709.11-99-1, December 01, 1999; 6709.11_10, Amendment 6709.11-2015-1, December 07, 2015; 6709.11_20-24, Amendment 6709.11-2016-1, July 19, 2016; 6709.11_25-27, Amendment 6709.11-99-1, December 01, 1999; 6709.11_30, Amendment 6709.11-99-1, December 01, 1999; 6709.11_40, Amendment 6709.11-99-1, December 01, 1999; 6709.11_50, Amendment 6709.11-99-1, December 01, 1999; 6709.11_60, Amendment 6709.11-99-1, December 01, 1999; 6709.11_70, Amendment 6709.11-99-1, December 01, 1999; 6709.11, Glossary, Amendment 6709.11-99-1, December 01, 1999; 6709.11, Index, Amendment 6709.11-99-1, December 01, 1999

Digest: Following is an explanation of the changes throughout the directive by section.

6709.11: Revised Handbook in its entirety.

12 - 13: Removes codes, captions, and direction for Motorized Vehicles and Specialized Equipment and recodes direction with revisions to FSM 7130.

14: Removes codes, captions, and direction for Aviation and recodes direction with revisions to the 2016 National Aviation Safety Management System Guide.

15: Removes codes, captions, and direction for Watercraft Safety and recodes direction with revisions to FSM 7130.

22: Removes codes, captions, and direction for Resource Management.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

22.3: Removes codes, captions, and direction for Recreation and recodes direction with revisions to FSM 2300.

22.4: Removes codes, captions, and direction for Forest Management and recodes directions with revisions to FSM 2000.

22.5: Removes codes, captions, and direction for Watershed and Air Management and recodes direction with revisions to FSM 2500.

22.6: Removes codes, captions, and direction for Wildlife, Fish, and Sensitive Plant Management and recodes directions with revisions to FSM 2630.

22.62: Removes codes, captions, and direction for Diving and recodes directions with revisions to FSH 4209.11.

22.7: Removes codes, captions, and direction for Special Uses and recodes directions with revisions to FSM 2700.

22.8: Removes codes, captions, and direction for Minerals and Geology and recodes directions with revisions to FSM 2800.

23: Removes codes, captions, and direction for State and Private Forestry.

24: Removes codes, captions, and direction for Research.

25.1: Removes codes, captions, and direction and recodes directions with revisions to Interagency Standards for Fire and Fire Aviation Operations.

25.2: Removes codes, captions, and direction on Smokejumping and recodes directions with revisions to Interagency Standards for Fire and Fire Aviation Operations.

25.3: Removes codes, captions, and direction on Law Enforcement and recodes directions with revisions to FSH 5309.11.

26: Removes codes, captions, and direction on Management Services.

27: Removes codes, captions, and direction on Engineering and recodes directions with revisions to FSM 7000 Series Publications.

36: Removes codes, captions, and direction for Electrical Standards and recodes direction with revisions to FSM 7600.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook

Chapter 50 - Employee Safety, Security, and Health

Amendment: 6709.11-2018-1

Effective date: December 03, 2018

37: Removes codes, captions, and direction for Occupational Health and Environmental Controls and recodes directions with revisions to FSM 7400.

38: Removes codes, captions, and direction for General Environmental Controls and recodes direction with revisions to FSM 7400.

44: Removes codes, captions, and direction for Heavy Equipment and recodes direction with revisions to EM 7130-2.

45: Removes codes, captions, and direction for Equipment Development and recodes direction with revisions to FSM 7120.

70: Changes chapter caption from “Job Hazard Analysis (Form FS-6700-7) and Personal Protective Equipment” to “Personal Protective Equipment, Glossary, and Index” and revises chapter in its entirety.

Table of Contents

51- Employee Safety and Security	7
51.01 - Authority	7
51.04 - Responsibility	7
51.04a - Supervisors	7
51.04b - Employees	7
51.06 - References.....	7
51.1 - Procedures.....	7
51.11 - Safety Practices	8
51.2 - Firearms for Non-Law Enforcement Personnel	9
51.21 - Authorization for Firearms	9
51.21a - Expiration of Firearms Authorization	9
51.21b - Employees with Occasional Need to Carry Firearms.....	10
51.22 - Firearms Training	10
51.22a - Firearms Training Course.....	10
51.22b - Shooting Proficiency	10
51.23 - Carrying of Firearms.....	10
51.23a - Privately Owned Firearms	11
51.23b - Firearms in Camp	11
51.24 - Firearms and Ammunition Storage.....	11
51.25 - Firearms Discharge Reporting Requirements.....	11
51.3 - Aerosol Defensive Sprays (ADS).....	12
51.31 - Authorization for Aerosol Defensive Sprays.....	12
51.32 - Aerosol Defensive Spray (ADS) Training	13
51.33 - Transportation and Storage	13
51.34 - Reporting Procedures	14
51.35 - Restrictions on Aerosol Defensive Sprays (ADS).....	14
52 - Employee Health and Wellness	14
52.01 - Authority	14
52.3 - Bloodborne Pathogens Program	15
52.31 - Scope of Employee Coverage	15
52.32 - Exposure Control Plan (ECP).....	15
52.33 - Training	15
52.34 - Hepatitis B Vaccination	15
52.4 - Ergonomics	15
52.41 - Cumulative Trauma Disorders (CTDs)	15
52.42 - Neck and Eye Strain	16
53 - Plant, Animal, and Insect Hazards	16
53.01 - Authority	16
53.1 - Poison Ivy/Oak/Sumac and Noxious Weeds.....	16
53.2 - Ticks and Chiggers	19

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

53.21 - Ticks - General Safety Procedures.....	19
53.22 - Chiggers - General Safety Procedures	22
53.3 - Poisonous Snakes, Spiders, and Scorpions	22
53.31 - Precautions for Working in Snake Country	24
53.31a - Snake Bite First Aid	24
53.4 - Spiders.....	24
53.5 - Scorpions	27
53.6 - Insect Stings and Bites.....	28
53.61 - Honey Bees.....	28
53.61a - Safety Guidelines	28
53.61b - Africanized Honey Bees.....	29
53.62 - Mosquitoes	29
53.7 - Bears, Mountain Lions, and Other Animals	30
53.71 - Bears	30
53.72 - Mountain Lions.....	32
53.73 - Other Animals and Hazards.....	32
53.73a - Hantavirus	32
53.73b - Rabies.....	34
53.73c - Plague (Reportable Disease)	35
53.73d - Tularemia (Reportable Disease)	35
53.73e - Lyme Disease (Borreliosis).....	36
53.73f - Echinococcosis.....	37
53.73g - Highly Pathogenic Avian Influenza (Reportable Disease)	38
53.73h - West Nile Virus (Reportable Disease)	38
54 - Environmental Hazards.....	39
54.01 - References.....	39
54.1 - Radiation	39
54.2 - Solar Ultraviolet Radiation	39
54.3 - Extreme Weather Conditions.....	40
54.31 - Working in Hot Conditions	40
54.32 - Working in Cold Conditions.....	46
54.32a - Frostbite	46
54.32b - Hypothermia.....	47
54.33 - Lightning and Thunderstorms.....	50
54.34 - Tornadoes	51
54.35 - Flash Floods.....	52
54.4 - Altitude-Related Problems	53
55 - Temporary Camps.....	53
55.01 - Authority.....	53
55.06 - Reference	53
55.1 - Procedures.....	53
55.11 - Temporary Camp Requirements.....	54

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

55.11a - Water Supply	54
55.11b - Other Requirements	54
55.11c - Camp Sanitation	55
55.11d - Food and Food Service Operations	56
55.12 - Spike Camps/Remote-Sites General Campout	60
55.12a - Preparations	60
55.12b - Other Concerns	60
55.12c - Cooking Operations.....	61
55.12d - Food Rations.....	62
55.12e - Water Purification of Undeveloped Sources	62
55.12f - After-Work, Organized Swimming Activities.....	63

51- Employee Safety and Security

Violence or the threat of violence by or against any employee is unacceptable. The Agency's procedures and programs set out in this section are designed to enhance employee safety and security.

51.01 - Authority

USDA Departmental Regulation 4200-1, May 31, 2000, "Workplace Violence Prevention Program."

Title 29, Code of Federal Regulations (29 CFR), section 1960.8(a) requires employers to provide a place of employment free from recognized hazards that are likely to cause death or serious physical harm.

The authorities regarding the protection of Government employees and their families are in Title 18, United States Code (18 U.S.C.), Parts 111 and 115, and 36 CFR 261.3.

51.04 - Responsibility

Management and employees share the responsibility to provide for workplace safety.

51.04a - Supervisors

Supervisors are responsible for implementing programs and procedures on how to prevent worksite violence and on how to provide appropriate response should violence occur.

51.04b - Employees

All employees have the responsibility to report all acts of workplace violence promptly to Supervisors and Managers and directly to law enforcement officials in case of an emergency.

51.06 - References

USDA Handbook on Workplace Violence Prevention and Response, October 2001.

51.1 - Procedures

1. Unit Managers ensure the unit develops and keeps current an Occupant Emergency Plan (OEP). Supervisors are required to ensure employees are familiar with their local OEPs and emergency procedures stated therein. The OEP should contain as a minimum the following elements:

- a. Building evacuation procedures.

- b. Accident/incident reporting procedures and guidelines.
 - c. Emergency telephone numbers.
 - d. Direction to provide the local OEP to employees.
2. Supervisors should conduct a risk assessment (RA) for facilities and tasks that involve employees' working alone or with the public. At a minimum, the RA should include a review of the following:
- a. Check-out/check-in protocols.
 - b. Provisions for the safety of employees who collect and transport funds.
 - c. Provisions for the safety of employees working alone in public contact centers and facilities.
 - d. Emergency activation and response procedures.
3. Field unit Managers shall ensure the unit maintains current field emergency evacuation plans that include the following pertinent information:
- a. Field evacuation procedures.
 - b. Accident/incident reporting procedures and guidelines.
 - c. Emergency telephone numbers.

51.11 - Safety Practices

All employees are responsible for the following:

- 1. Be aware of your immediate area and be suspicious of unusual or abnormal activity or objects, such as packages or boxes. Do not attempt to open or handle such objects. If you think a situation may be dangerous, leave the area and report it to a Supervisor, local authority, or the nearest law enforcement agency.
- 2. Be aware of and follow check-in/check-out procedures.
- 3. Ensure vehicles are operating properly and are equipped for the specific task.
- 4. Travel in pairs where warranted.
- 5. Avoid areas and situations of known or potential natural or human-caused conflict. Analyze the hazard and use alternative methods and/or routes where possible.
- 6. Ensure communications equipment is operating properly.

7. Consider the implications for personal safety when deciding whether to wear the Forest Service uniform and/or drive a Forest Service-marked vehicle.

51.2 - Firearms for Non-Law Enforcement Personnel

(For direction on use of firearms by law enforcement personnel, see FSM 5300.) This section describes authorized use of firearms by non-law enforcement employees. Use of firearms for non-law enforcement purposes is prohibited for non-law enforcement employees on Forest Service work projects and activities or in crew quarters, camps, or vehicles unless approval is documented in a RA.

51.21 - Authorization for Firearms

1. Regional Foresters, Forest Supervisors, Station Directors, the Area Director, or the Institute Director may authorize non-law enforcement employees to carry firearms when functions or circumstances related to official duties necessitate such permission.
 - a. Firearm use while on official business must be limited to employees who have been authorized to carry firearms, have successfully completed a firearms safety course, and are included in the Executive Order 12564, Drug-Free Federal Workplace (drug testing) Program.
 - b. Authorizations must be in writing, and training must be documented.
2. The reason for approval to use firearms for administrative activities, such as protection from animals and cone collection, must be identified in the risk assessment (RA), as well as the specific firearm type. Loaded firearms must not be permitted in boats, buildings, camps, or on horseback, except as defined in the RA.
3. Unit Managers shall ensure the unit prepares an annual report on the use, storage, inspection, and safekeeping of weapons and ammunition. A Line Officer-designated inspector shall inspect all Forest Service firearms at the end of each field season. Results of these inspections must be included in the annual report. A qualified gunsmith shall accomplish repair work.

51.21a - Expiration of Firearms Authorization

The employee's authorization to carry a firearm will expire in one of the following situations:

1. At the end of the calendar year.
2. Upon completion of the work project or activity.
3. If there is a change of duty station, status, or transfer.
4. Upon failure to demonstrate shooting proficiency as required.

5. If rescinded by an authorizing officer for any other reason.

51.21b - Employees with Occasional Need to Carry Firearms

Seasonal or part-time non-law enforcement employees or full-time employees who have only an occasional need to carry firearms shall demonstrate proficiency once at the beginning of each term of employment or the beginning of each field season requiring the use of firearms. These employees shall also adhere to the requirements outlined in section 51.21a above and section 51.22b below.

51.22 - Firearms Training

Only those persons who are qualified in firearms use and who have completed a firearms safety course may be authorized to use or carry firearms. Firearms instructors for such courses shall be certified according to standards established and approved by the Federal Law Enforcement Training Center, Federal Bureau of Investigation, or National Rifle Association. Firearms safety courses must be developed under the direction of and approval of a Regional Forester, Forest Supervisor, Station Director, Area Director, or Institute Director, and the Special Agent-in-Charge.

51.22a - Firearms Training Course

A firearms training course must include the following:

1. Firearms safety and handling.
2. Proper firing techniques, including the demonstration of weapons proficiency on a firing range.
3. Legal and ethical aspects of firearms use.
4. Animal behavior (when applicable).

51.22b - Shooting Proficiency

Full-time employees authorized to carry firearms in the course of employment shall demonstrate their shooting proficiency (70 percent or better) for each type of firearm carried, and they shall shoot for the record at least once each year under the direction of an approved instructor. Seasonal or part-time employees are required to demonstrate proficiency once at the beginning of each employment term.

51.23 - Carrying of Firearms

Employees shall observe all Federal and State laws and local ordinances concerning the licensing, use, and transportation of firearms and ammunition. Employees are prohibited at all times from using Government vehicles or equipment for the express or incidental purpose of

hunting, shooting, or transporting of game, hunters, firearms, or ammunition. Violators are subject to disciplinary action and/or prosecution under the law.

51.23a - Privately Owned Firearms

The voluntary use of privately owned firearms may be permitted in accordance with Federal and Forest Service property management regulations and the safety requirements of this Handbook.

51.23b - Firearms in Camp

The use of firearms is prohibited in camp areas or during work hours except when required for employee safety or if in the best interests of the Forest Service, as determined by the local Line Officer.

51.24 - Firearms and Ammunition Storage

Ensure that all firearms not in active use are unloaded before storage and stored in a secure place, under lock and key. Whenever possible, store weapons and ammunition separately. Do not store firearms in crew quarters.

1. Persons residing in family housing at administrative sites may keep firearms, but they must be in a locked storage container as authorized by the local Line Officer.
2. Forest Supervisors or Station Directors may establish policies to authorize locked storage of personal firearms at Government facilities. Such authorization must require that firearms be kept unloaded at all times while on the administrative site and must be kept in suitable secure storage.
3. Management or supervisory personnel shall retain responsibility for access to such locked storage. A check-out/check-in system must also be part of this storage arrangement.
4. Firearms will not be loaded or unloaded in occupied facilities of any kind, including administrative offices, crew quarters, hotel rooms, and so on unless authorized under a written RA that ensures no one could be injured by an errant round should an accidental weapons discharge occur. With very rare exceptions, loading and unloading procedures will only be accomplished under the direct supervision of another authorized employee and only when a clearing barrel or other device is present to contain an accidental weapons discharge should one occur or outside where an errant round would be absorbed by soft terrain.

51.25 - Firearms Discharge Reporting Requirements

Reporting procedures involving the use of a firearm:

1. With the exception of cone removal and predatory bird control weapons firing, any employee who discharges a firearm while in the commission of official duties, whether intentionally or accidentally, shall notify the immediate Supervisor as soon as possible, as well as the local law enforcement officer. The immediate Supervisor may request the employee to provide a brief narrative of the incident as a follow-up to the initial notification.
2. The employee's immediate Supervisor shall report the incident to the appropriate Line Officer as soon as possible.
3. The Line Officer, in coordination with local agency law enforcement, shall determine if additional actions need to be taken.

51.3 - Aerosol Defensive Sprays (ADS)

This section describes the authorized use of aerosol defensive sprays (ADS) by designated and trained non-law enforcement personnel for protection from physical harm or personal injury, primarily by threatening wild or domestic animals.

51.31 - Authorization for Aerosol Defensive Sprays

1. Regional Foresters, Forest Supervisors, Station Directors, Area Director, and Institute Director may authorize employees to carry and use ADS in the following situations:
 - a. When circumstances or functions related to official duties warrant added personal protective measures.
 - b. Employees operate within the scope of their employment on National Forest System lands or other lands and properties under the control of the Forest Service.
 - c. Designated employees successfully complete ADS training.
2. Approval for employees to carry and use ADS must be identified in a risk assessment signed by the Line Officer.
3. Employee authorization to carry and use ADS will expire in the following situations:
 - a. At the end of the calendar year.
 - b. Upon completion of the work project or activity.
 - c. Upon a change of duty station, status, or transfer.
 - d. Upon failure to demonstrate competent and prudent use of ADS.

51.32 - Aerosol Defensive Spray (ADS) Training

Only those employees who have successfully completed an ADS safety course and demonstrated ability in its use may be authorized to carry and use ADS.

1. Unit Managers shall ensure the unit develops an ADS safety course with a field practicum for employees designated to carry and use aerosol defensive sprays. The course must include the following, at a minimum:
 - a. Direction contained in sections 51.3 through 51.35.
 - b. Definition of the active ingredient(s) in ADS, such as oleoresin capsicum.
 - c. Effects of ADS on wild animals, domestic animals, and humans.
 - d. Storage and transportation requirements, including shelf life (sec. 51.33).
 - e. Procedures for readying, carrying, and using ADS.
 - f. Medical considerations.
 - g. Animal behavior and habitat (as applicable).
 - h. Reporting procedures (sec. 51.34).
 - i. Instructor demonstration in the ADS use.
2. Persons designated to provide ADS safety course instruction shall successfully complete a course sponsored by an ADS manufacturer or a recognized trainer in the use of ADS or an equivalent training course or shall be appointed by a Line Officer based on their demonstrated knowledge and experience before convening training. Instructors shall also possess knowledge in animal behavior and habitat (as applicable).
3. Designated employees successfully completing an ADS safety course shall be given documented evidence of completion, such as a certificate or equivalent, and the immediate Supervisor shall maintain training records on site.
4. A refresher training course is required every two years for those employees whose authorization to carry and use ADS will extend beyond a two-year timeframe. Refresher training must include the minimum requirements prescribed in section 51.32.

51.33 - Transportation and Storage

The following applies to aerosol defensive sprays (ADS):

1. Must not be carried or transported aboard commercial aircraft at any time.

2. May be transported aboard U.S. Department of Agriculture owned, leased, or contracted aircraft provided they are securely stored in an approved safety container.
3. May be transported in U. S. Department of Agriculture owned, leased, or contracted motor vehicles provided they are securely stored in an approved safety container.
4. Must be stored in a manner to limit access to authorized individuals only.
5. Should not be stored above room temperature, near heat sources or open flames, nor placed in areas that subject ADS to extreme temperatures, such as glove boxes, vehicle trunks, or on dashboards.

51.34 - Reporting Procedures

Reporting procedures involving the use of aerosol defensive sprays (ADS) are as follows:

1. Any employee who discharges in the commission of official duties shall notify the immediate supervisor as soon as possible. The immediate supervisor may request the employee to provide a brief narrative of the incident as a follow-up to the initial notification.
2. The employee's immediate supervisor shall report the incident to the appropriate Line Officer as soon as possible.
3. The Line Officer shall determine if additional actions need to be taken to ensure a safe work environment for their employees.

51.35 - Restrictions on Aerosol Defensive Sprays (ADS)

1. Authorized employees shall only carry ADS issued by the Forest Service.
2. Authorized employees shall not carry or use Forest Service-issued ADS off duty without Line Officer-written approval.
3. ADS must be disposed of properly following manufacture instructions.

52 - Employee Health and Wellness

52.01 - Authority

The authority for health requirements related to temporary labor camps and bloodborne pathogens is in Title 29, Code of Federal Regulations (29 CFR), sections 1910.141 - 1910.142 and 1910.1030.

52.3 - Bloodborne Pathogens Program

52.31 - Scope of Employee Coverage

Title 29, Code of Federal Regulations (29 CFR), section 1910.1030 provides specific program requirements for employees who could be "reasonably anticipated," as the result of performing their job duties, to come in contact with blood; body fluids visibly contaminated with blood; or body fluids where it is difficult or impossible to differentiate between body fluids.

52.32 - Exposure Control Plan (ECP)

Unit managers shall ensure the unit conducts an assessment to determine if any employees have potential exposure as stated in section 52.31 above. Units with potential exposure will develop a local exposure control plan (ECP). As part of the ECP, managers and supervisors will determine those employees and those job classifications with occupational exposure to bloodborne pathogens. Occupational exposure is defined as reasonably anticipated skin, eye, mucous membrane, or parenteral (a piercing of mucous membrane or skin barrier by needle sticks, human bites, cuts, and abrasions) contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

52.33 - Training

Employees placed on the local unit ECP shall receive Bloodborne Pathogens training upon assignment. Training must meet the requirements outlined in 29 CFR 1910.1030.

52.34 - Hepatitis B Vaccination

Employees placed on the local ECP shall either receive, at no cost to employees, Hepatitis B Vaccinations or will sign a declination letter indicating they have declined the series, usually three vaccines, of Hepatitis B vaccinations. The vaccine should be administered within 10 working days of the assignment. The employee may later opt to receive the vaccine at no cost to the employee.

52.4 - Ergonomics

Ergonomic assessments in the workplace can reduce fatigue, discomfort, and potential injury. Minimizing stress, strain, and repetitive motion can prevent injuries and illnesses, such as cumulative trauma disorder (CTD), back injury, and neck and eye strain.

52.41 - Cumulative Trauma Disorders (CTDs)

The Occupational Safety and Health Administration (OSHA) defines CTDs as a group of illnesses associated with ongoing damage to soft tissues (muscles, tendons, and nerves) and joints. CTDs include repetitive motion injuries, such as carpal tunnel syndrome, repetitive strain injuries, and musculoskeletal disorders.

Three risk factors that can lead to CTDs are awkward posture/position, force (excessive pressure on muscles and joints), and repetition.

52.42 - Neck and Eye Strain

Steps to avoid neck and eye strain follow:

1. Provide good general illumination and specific task lighting.
2. Maintain the proper distance between the operator and the computer screen. Operators should occasionally focus eyes off screen on a distant object.
3. Provide video display terminal (VDT) operators periodic breaks of at least 10 minutes per hour away from the terminal.

53 - Plant, Animal, and Insect Hazards

When appropriate, unit Managers shall provide seasonal alerts about animal, insect, and plant hazards prevalent locally. Ensure employees know preventive measures and how to render first aid for related local hazards.

53.01 - Authority

The authority for general safety and health provisions, training, and education related to animal, insect, and plant hazards is in Title 29, Code of Federal Regulations (29 CFR), sections 1926.20 and 1926.21.

53.1 - Poison Ivy/Oak/Sumac and Noxious Weeds

Employee contact with hazardous plants such as poison ivy/oak is one of the leading causes of reported injuries and illnesses each year. It is critical to instruct all employees who are subject to exposure, especially those known to be highly sensitive, in plant identification. Supervisors should not assign allergic employees to jobs that expose them to those plants and weeds, when possible (53.1, exhibit 01 and 53.1, exhibit 02). Supervisors should brief field-going employees concerning the following:

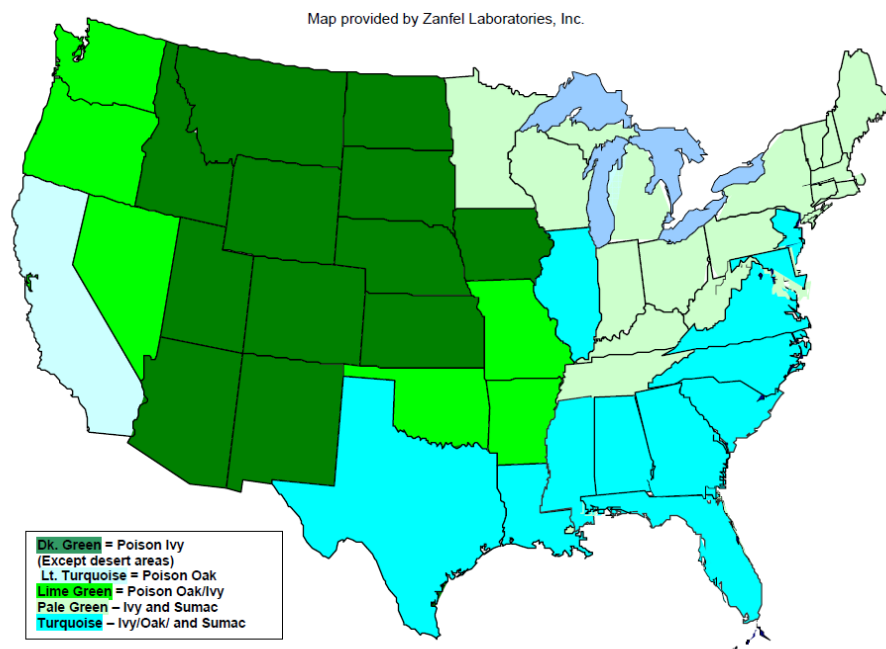
1. Poisonous plants and noxious weeds present in the work area. Even those who have no history of reactions may become sensitized after contact and have a serious reaction.
2. When working in areas where poisonous plants or noxious weeds may be present, employees should observe the following:
 - a. Wear proper field attire.
 - b. Provide and apply a skin protectant or barrier cream. Fasten pant legs securely over boot tops (adhesive tape may be necessary).

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

- c. Wear gloves and keep them away from the face and other exposed parts of the body. Do not touch skin with hands, clothes, or equipment that may have contacted poisonous plants or noxious weeds.
- 3. Whenever the skin contacts a poisonous plant or noxious weed, wash the area with cold water within one to three minutes or as soon as possible. Use liberal amounts of water to ensure that all poisonous oils are washed off. While working in the poisonous plant or noxious weed environment, do not use soap and/or hot water because those elements can remove the skin's natural protective oils.
- 4. Destroy poisonous plants and noxious weeds around improved areas.
- 5. Avoid the smoke of burning poisonous plants. Inhaling this smoke can cause fever, malaise, tracheitis, bronchitis, and severe rash.
- 6. Upon returning from the field, use rubbing alcohol to cleanse skin that contacted poisonous plants.
- 7. Clean tools with citric-based solvent before storing (use appropriate gloves and adequate ventilation).
- 8. Avoid exposure through mishandling of contaminated clothes. Wash contaminated clothing separately from other clothes in hot water and detergent.

53.1 - Exhibit 01

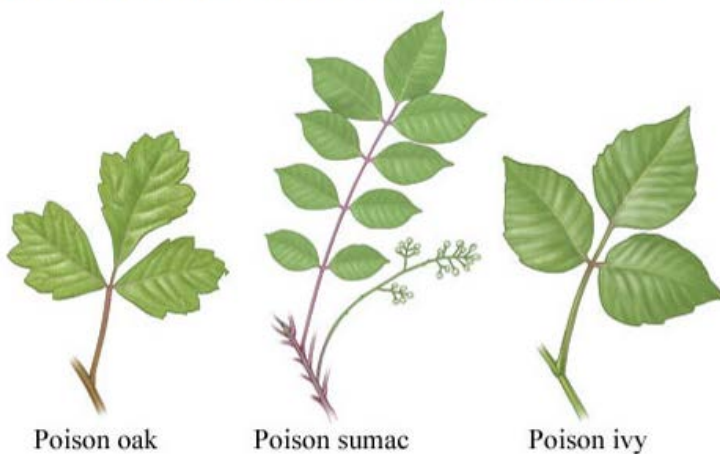
U.S. Prevalence of Poison Ivy, Oak & Sumac



Source: United States Department of Agriculture Plants Database, <http://plants.usda.gov/>

53.1 - Exhibit 02

Poison ivy, oak, and sumac leaves



53.2 - Ticks and Chiggers

Ticks are carriers of biological agents that cause Rocky Mountain spotted fever, Colorado tick fever, tick paralysis, Lyme disease, tularemia, and relapsing fever (53.3, Exhibit 01).

53.2 - Exhibit 01



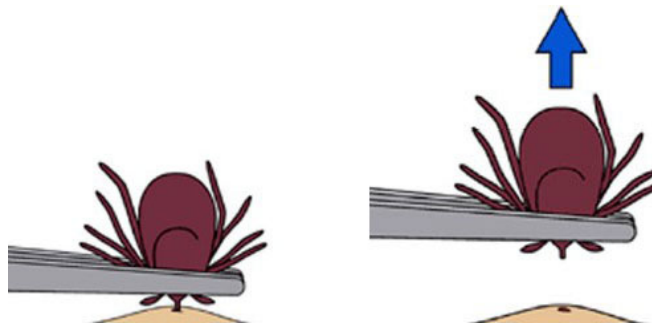
53.21 - Ticks - General Safety Procedures

When working in an area likely to have infected ticks, employees should observe the following:

1. Spray clothes with an insect repellent, which may provide an additional barrier against ticks. Repellents, such as diethyl metatoloamide (DEET), do not kill ticks. Some sprays do contain permethrin, which kill ticks on contact. Always follow the manufacturer's application instructions for insect repellents and treatments.
2. Wear light-colored clothing that fits tightly at the wrists, ankles, and waist. Each outer garment should overlap the one above it. Cover trouser legs with high socks or boots and tuck shirttails inside trousers.
3. Search the body repeatedly (such as during rest periods and lunch), especially hairy regions and inside clothing, as ticks seldom attach themselves within the first few hours.
4. Tick removal (ex. 01) techniques follow:
 - a. Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
 - b. Pull upward with steady, even pressure. Don't twist or jerk the tick; this can cause the mouth-parts to break off and remain in the skin. If this happens, remove the mouth-parts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and allow the skin to heal.

5. Observe the following after removing a tick:
 - a. Thoroughly clean the bite area and hands with rubbing alcohol, an iodine scrub, or soap and water.
 - b. Place the tick in an empty container so it can be given to a physician or sent to a laboratory for testing.
 - c. Report the incident through eSafety.
 - d. Seek medical treatment. Early signs to look for are a red spot/ring around the tick bite location, fever, chills, headache, joint and muscle ache, significant fatigue, and facial paralysis.
6. Prompt medical attention should be sought for any of the following:
 - a. Rocky Mountain spotted fever. Within two to 14 days, sudden onset of headache, chills, fever, and general aches; reddish-purple-black spots appearing on the extremities and spreading to the trunk, neck, and face (80 percent of cases).
 - b. Colorado tick fever. Sudden high fever, chills, fatigue, severe headache, and muscle aches.
 - c. Tick paralysis. Within four to six days, rapid paralysis starting in the extremities and extending to the face area.
 - d. Lyme disease. Within three days to several weeks, a ring-like rash develops in 60 to 80 percent of cases, along with flu-like symptoms that disappear even if not treated. Within weeks to months, neurologic abnormalities, including meningitis, encephalitis, and cardiac abnormalities, may become chronic. Within six months to several years, joint and muscle pain and arthritis may occur in one or several joints.
 - e. Tularemia. Chills, fever, loss of appetite, swollen lymph nodes, and ulcer at the wound site.
 - f. Relapsing fever. High fever, chills, and abdominal pain; these symptoms subside, only to reoccur at a later date.
 - g. Meat allergy. Lone star ticks (*Amblyomma americanum*) can cause a novel form of delayed IgE mediated hypersensitivity to red meat (also lamb, pork, and game) that is related to serum IgE antibodies to the oligosaccharide galactose-alpha-1,3-galactose (alpha-gal) in mammalian blood. Symptoms range from a mild itch with possible hives to anaphylactic shock, which must be treated with epinephrine.

53.21 - Exhibit 01



53.22 - Chiggers - General Safety Procedures

In chigger-infested areas, employees should observe the following:

1. Apply insect spray according to the manufacturer's application instructions.
2. Do not sit on the ground or on logs and avoid walking through low vegetation when possible.
3. Bathe in hot, soapy water after spending time in these areas.

53.3 - Poisonous Snakes, Spiders, and Scorpions

Rattlesnakes, copperheads, and water moccasins (cottonmouths) are poisonous snakes known as pit vipers. They have vertically elliptical (egg-shaped) pupils, a heat-sensing pit midway between the eyes, and nostrils on each side of a triangularly shaped head.

The coral snake (also poisonous) may be identified by this rule of thumb: Red bands bordered by yellow (or white) indicate a venomous animal; thus, "Red on yellow, kill a fellow; red on black, venom lack." This rule applies to all coral snakes native to the United States. Employees should observe the following:

1. Learn what poisonous snakes (if any) are native to the area in which you will be working.
2. Learn how to identify whether or not a snake is poisonous. If unsure, treat all snakes as poisonous. Study field guides or text book illustrations of indigenous venomous snakes (ex. 01).
3. Do not assume a young snake is not poisonous; venomous snakes are capable of inflicting a fatal bite from birth.

53.3 - Exhibit 01 - Rattlesnake

Copperhead



Coral Snake



53.31 - Precautions for Working in Snake Country

When working in snake-infested areas, employees should proceed as follows:

1. Wear high top boots (just below the knee is preferred) and/or protective snake-proof leggings. Use a hiking stick.
2. Although snakes are deaf, they have a good sense of smell and vision and are very sensitive to ground-conducted vibrations. Since they are defensive animals and rarely attack, they remain immobile or attempt to retreat if given the opportunity. When going through thick underbrush, be alert. Walk slowly and give snakes ample time to move out of the way.
3. Be particularly watchful in areas obscured by foliage or near ledges when walking or climbing in rocky country. Snakes have excellent camouflage ability, so train your eyes to see their shape and coloration.
4. Walk on clear paths as much as possible. Be careful where placing your feet and hands at all times.
5. Probe areas with a hiking stick or long-handled tool before stepping over logs or piles of brush or debris.
6. Use a long bar or pole for moving material and timbers that have been stacked or piled. Never put your hands under any stored material and be especially cautious when moving rocks.

53.31a - Snake Bite First Aid

Snake bites in the United States are rarely fatal when medical care is sought early and appropriate antivenin is readily available. If an employee is bitten, the following should be observed:

1. Avoid panic.
2. Immobilize the bitten extremity and obtain medical assistance.
3. If you are alone when bitten, walk slowly, resting periodically and using a makeshift crutch if the lower extremity is involved. Again, keep activity to a minimum.

53.4 - Spiders

Few spiders in the United States have venom that cause death. But the bites of the black widow and the brown recluse spiders can be fatal. Both spiders are found in most areas of the United States. The bite of the black widow is the more painful and often the more deadly of the two. Both prefer dark, out-of-the way places where they are seldom disturbed. Employees should be

alert for these spiders in basements, garages, barns and other outbuildings; woodpiles and gardens; and under stones, logs, and vegetation.

1. Aggressive House Spider. Another dangerous spider is the aggressive house spider, otherwise known as the Hobo Spider. The spider got its name because it readily bites when cornered or threatened. Its bite is not fatal but is serious and requires immediate medical attention. The light brown spider's body is in two segments that together are about half an inch (12-3/4 mm) long, excluding its hairy legs. This spider is among the most common spiders found in buildings. It rarely climbs vertical surfaces and is usually found on the ground or lower floors, especially in cool moist window wells and basements.
2. Female Black Widow Spider. The female black widow is shiny black with a red hourglass mark on the stomach. The female's body is about half an inch (12-3/4 mm) long, and the male is less than half this size. The initial bite may be sharply painful, but many bites are not recognized initially.
3. Brown Recluse Spider. The brown recluse is light brown with a darker brown violin-shaped marking on the top of its 1/3 inch to 2/3 inch (8-15 mm) body. Brown recluse spiders are most active at night from spring through fall, emerging from woodpiles, rat nests, and other dark, dry environments. The bite can vary from a mild and transient skin irritation to more complicated kidney and other disorders and even death. Refer to 53.4, exhibit 01 for identification.
4. Spider Bites. The aggressive house spider has a bite often confused with that of a brown recluse spider. At first the bite produces a very slight sensation. A small hard area appears within 30 minutes or less and is surrounded by an expanding reddened area of two to six inches (51-153 mm) in diameter. The area will blister and eventually break and ooze serum. Although the ulcer scabs over, tissue beneath the scab may continue to die. The loss of tissue may become so severe that surgical repair is needed. Similar to the necrotic bite of a brown recluse spider (a necrotic bite causes tissue to die), the resulting lesion heals slowly, frequently leaving a permanent scar.

The most common spider bite symptom is a severe migraine headache, sometimes occurring within 30 minutes, usually within ten hours. The headache may persist for two to seven days and is sometimes accompanied by nausea, weakness, tiredness, temporary loss of memory, and vision impairment.

Spider bite signs include the following:

- a. Nausea and vomiting.
- b. Difficulty breathing and swallowing.
- c. Sweating and salivating profusely.

- d. Irregular heart rhythms.
 - e. Severe pain and swelling in the bite area.
 - f. A mark indicating a possible bite.
5. Spider bite first aid is as follows:
- a. Wash the area with soap and water.
 - b. Apply a cold pack.
 - c. Seek medical care as soon as possible to receive antibiotics and/or an antivenin.

53.4 - Exhibit 01 – Spiders Images

Hobo Spider



Black Widow



Brown Recluse



53.5 - Scorpions

Scorpions in the United States are divided into two groups based on the severity of their sting. Scorpions whose venom can be lethal are found in the desert areas of Arizona, California, New Mexico, and Texas, as well as along the northern shore of Lake Mead in Nevada. The venom of these scorpions contains neurotoxins that produce systemic effects, as well as local burning and pain, which can be accentuated by tapping over the envenomed area (tap test). All other scorpions in the United States produce a local reaction that consists of painful swelling and burning with a discoloring of the skin.

Today, death from the sting of a "lethal" scorpion is preventable. Proper care includes washing the wound, applying a cold pack, and getting medical help as soon as possible to receive antivenin.

Scorpions are nocturnal feeders, and most live above ground and hide in firewood, ground debris, loose bark on fallen trees, lumber piles, old stumps, lumber piles, or crevices during the daytime.

When working in scorpion and spider areas, employees should be aware and take these precautions:

1. When camping, always inspect in and under sleeping pads, sleeping bags, tarps, or other ground covers before use.
2. Always inspect and shake out clothing before wearing.
3. Do not leave boots, hats, jackets, or work gloves on the ground.
4. Always inspect outdoor toilets before use.
5. Never walk around in the dark without wearing boots or shoes.
6. Always have a flashlight for inspecting bedding, clothing, and outhouses.
7. Always inspect logs, rocks, stumps, and any other areas before sitting down.
8. When working in dry, hot areas, be especially watchful when using shady spots for rest breaks.
9. Inspect items that have been stored in the shade while working, before use.
10. Always wear gloves (leather preferred) when moving or handling debris, firewood, lumber, or trash that could hide or contain spiders or scorpions.

If an area that was stung or bitten shows rapid inflammation and pain or the person bitten or stung develops other symptoms, such as chills, fever, joint pains, nausea, or vomiting, seek medical attention immediately.

53.6 - Insect Stings and Bites

53.61 - Honey Bees

The honey bee is one of the few domesticated insects that is maintained in hives. Numerous honey bee species exist. The Italian honey bee, a common strain of Europe, is also widespread in the United States. Wild honey bee colonies usually nest in hollow trees or crevices in rocks but may nest in walls of occupied buildings.

An event of considerable health concern has been the spread of the Africanized honey bee. This strain is characterized by large populations (one queen may lay tens of thousands of eggs), frequent swarming, nonstop flights of at least 12 miles (19 km), and a tendency toward mass attack following minimal provocation.

1. Single stings from any of these insects generally do not require medical attention. There may be an immediate sharp pain followed by redness and swelling. For mild bee stings, application of ice packs often gives relief. Honey bees and yellow jackets occasionally leave their stinger in the wound. Stingers should be scraped or brushed off with a sharp-edged instrument. Do not remove stingers with tweezers, which may squeeze the attached venom sac and worsen the injury.
2. Some individuals are sensitized to bee and wasp stings and may react with a widespread rash, asthmatic breathing, tissue swelling, a blood pressure drop, or sometimes unconsciousness. Employees with a history of allergic reactions to insect stings should carry an appropriate emergency kit prescribed by a physician and wear medical identification tags. Such employees should also inform supervisors and co-workers of their situation and what assistance, if any, is appropriate for an allergic reaction.

53.61a - Safety Guidelines

Employees should observe the following safety guidelines:

1. For outdoor field work always wear appropriate field attire, including long-sleeved shirts, long trousers, and appropriate boots. It is recommended to tuck trouser legs into socks.
2. Wear appropriate light-colored clothing, including socks. Avoid wearing leather. When defending their nests, bees target objects that resemble their natural predators (such as bears and skunks). They tend to seek out dark, leather, or furry objects. Bees see the color red as black, so fluorescent orange is a better work clothing choice than red.

3. Avoid wearing scents of any kind. Bees communicate by scent and tend to be very sensitive to odors. Avoid strongly scented after-shaves, perfumes, shampoos, or soaps. If riding horseback, avoid the use of lemony or citrus-smelling fly control products on the animal.
4. Avoid identified nests and never poke or throw objects at nests. If a nest location could affect people, inform your supervisor or local authorities even if the bees appear to be docile.
5. If attacked, shield your face with your arms and leave the area.

53.61b - Africanized Honey Bees

These bees are docile when seeking out a new nest site and establishing a nest. In the field, European honey bees and Africanized honey bees are visually indistinguishable, but the following are behavioral patterns typical of the Africanized honey bees:

1. Africanized honey bees display random nest selection. They may nest in areas not normally selected by European honey bees; however, they have been known to take over European honey bee nests.
2. After developing brood and honey stores, Africanized honey bees become extremely defensive and easily agitated.
3. When in established hives, Africanized honey bees quickly respond in large numbers to nearby stimuli, such as a loud noise created by chain saws or working machinery.
4. Africanized honey bees are attracted mainly to the face and neck area. If attacked, get away quickly while covering the head and neck area. Do not stand still, swat, or try to hide underwater. Seek inside shelter, such as buildings or vehicles.
5. If stung, remove stinger(s) by scraping sideways, not pulling. Seek medical attention if an employee has any of the following:
 - a. Allergic reaction.
 - b. Systemic reaction.
 - c. Multiple stings (15 or more).

53.62 - Mosquitoes

When massive flooding occurs, a significant increase in mosquito populations also increases the chances of an outbreak of encephalitis. Ticks that ingest mosquitoes may also transmit encephalitis to humans. Encephalitis produces influenza-like symptoms, including headaches, lethargy, fever, double vision, extreme muscle weakness, confusion, tremors, or seizures.

Use of repellents containing DEET or brand name products, such as Duranon, is recommended. Note: Duranon is applied to clothing only, not directly to the skin.

53.7 - Bears, Mountain Lions, and Other Animals

53.71 - Bears

1. Black Bear. The most common bear encountered by field-going Forest Service employees is the black bear. Black bears are the most numerous and widely distributed of all North American bears. They occur in more than 30 of the lower 48 states, from Maine to Florida and from California to Washington. They also occur throughout Canada and Alaska, extending up to tree line below the Arctic Circle.

Injuries as a result of close encounters with black bears are extremely rare and if they occur, usually are not life threatening. In a survey of 500 people injured by black bears, at least 90 percent resulted in minor scratches or bites inflicted by bears that were either conditioned to human foods or habituated to human presence.

2. Grizzly Bear. The grizzly (brown) bear ranges from Alaska through western Canada, with remnant populations located primarily in the northern Rocky Mountains. Grizzly bear attacks are rare and sporadic. Female grizzly (brown) bears are extremely aggressive in defense of their young.

3. Bear behavior and safety training.

Bear-behavior training should, as a minimum, include these elements:

- a. Differences between black and grizzly (brown) bears (53.71, ex. 01).
 - b. Identification of bear signs (claw marks, kills, scat, scrapes, and tracks).
 - c. Bear behavior and body language.
 - d. Precautions to keep a field camp safe from bears. Acceptable storage of food and food containers.
 - e. Techniques to avoid bear encounters while camping, hiking, working, or other outdoor activities.
 - f. Bear attack responses (sec. 51.21 and sec. 51.3).
 - g. Aerosol defensive spray (ADS) use, storage, and transportation (refer to sec. 51.3 for the requirements).
4. Safety Practices. Employees must understand the importance of keeping their distance from any animal that is eating or mating, appears to be sick or injured, or is with

its young. If an animal seems unafraid, abnormally aggressive, or drunk, it may be a sign of rabies. Leave the scene and report the incident to the appropriate authority.

Most bears prefer to stay away from humans. Given the chance, bears avoid people and go about their business.

53.71 - Exhibit 01 - Differences Between Black and Grizzly (Brown) Bears



53.72 - Mountain Lions

Generally, mountain lions are solitary, quiet, elusive animals. They are most active from dusk to dawn although they travel and hunt in daylight. Working with other employees and making noise reduces the chance of surprising a lion. In the event of a confrontation, employees should behave as follows:

1. Give the lion a way to escape.
2. Talk calmly yet firmly.
3. Stop or back away slowly. Never crouch, run away, turn away, or try to hide.
4. Try to appear larger by raising arms or an object over your head.
5. If the lion behaves aggressively, throw stones, branches, or whatever can be reached without crouching down or turning away.
6. Fight back if attacked. Shout loudly. Try to remain standing. If down, try to get up. Protect the head and neck with hands and arms.

53.73 - Other Animals and Hazards

53.73a - Hantavirus

1. Agent. Sin Nombre Hantavirus can cause Hantavirus Pulmonary Syndrome (HPS). Other hantaviruses include Bayou virus, Black Creek Canal virus (southeastern U.S.), and New York virus (northeastern U.S.).
2. Hosts. Primary carriers are the deer mouse, white-footed mouse, cotton rat, and rice rat, depending on the geographic regions. Other rodents that may be carriers include chipmunks, squirrels, and other kinds of mice and rats.
3. Transmission. Occurs by inhalation of the aerosolized virus when dried materials contaminated by rodent excreta are disturbed; introduction into broken skin, eyes, nose, mouth; or ingestion of contaminated food or water. People have also become infected after being bitten by an infected animal.
4. Symptoms in humans. Acute pulmonary disease and death in many regions of the United States. Symptoms may appear one to eight weeks after exposure and include fever, chills, nausea/vomiting, diarrhea, abdominal pain, headache, dizziness, muscle aches, cough, and increasing respiratory distress leading to death without treatment.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

Steps to minimize risk and/or prevent exposure follow:

1. Unit planning and safety procedures. Managers whose units have potential exposure shall ensure the unit develops a Hantavirus Prevention Action Plan. Contact State and county public health agencies for local recommendations. The Center for Disease Control and Prevention (CDC) has issued guidelines for hantavirus prevention.
2. Training. In affected areas, unit Managers shall ensure employees receive training in hantavirus awareness.
3. General employee safety practices. In most cases, employees shall behave as follows:
 - a. Treat all rodents as if they carry the virus.
 - b. Seek early treatment if there was possible contact with carriers and signs of potential symptoms.
 - c. Avoid direct contact with rodents (live or dead), their droppings, urine, saliva, nests, or items that may be contaminated. Do not feed chipmunks, mice, or other rodents.
 - d. Prevent exposure to any aerosolized virus by wearing proper PPE. Ventilate closed buildings or areas inside buildings by opening doors and windows for at least 30 minutes. Use cross ventilation if possible. Leave the area until the airing-out period is finished.
 - e. Always wear rubber or disposable gloves and a face mask or respirator when cleaning areas where rodents have been.
 - f. Do not sweep or vacuum until the area has been soaked with disinfectant (bleach solution). Carpets and furniture should be disinfected or shampooed. Launder bedding and clothing with detergent and warm/hot water. Dry the clothing and bedding in a dryer to aid in disinfection.
 - g. Where there is heavy rodent infestation, wear high efficiency National Institute of Safety and Health (NIOSH)-certified particulate air respirators, such as the N95 Particulate Respirator; disposable coveralls; rubber boots or disposable shoe covers; disposable head cover; two pairs of latex gloves; and eye protection, such as goggles.
4. Specific employee safety practices. Unit Managers shall ensure that employees involved in live trapping for research studies are competent in wild animal capture techniques developed to abate hantavirus exposure and that they comply with the following:

- a. Wear required PPE, which includes high efficiency particulate air respirators, disposable coveralls, disposable shoe covers, suitable eye protection, and two pair of latex gloves.
- b. Decontaminate live traps by soaking in a disinfectant virucide. Follow precautions for accidental exposure listed on the virucide label and the safety data sheet (SDS).
- c. Treat as biohazardous material waste and properly dispose of items (such as capture bags and gloves) that cannot be completely disinfected. Except in remote areas, burying and incineration are not appropriate disposal means.

53.73b - Rabies

1. Agent. The rabies virus is a Lyssavirus in the Rhabdoviridae family that causes an acute, fatal, viral disease.
2. Hosts. All warm-blooded animals are susceptible, but the disease is most commonly reported in bats, coyotes, foxes, raccoons, and skunks. Rabies also has been reported in deer, groundhogs, opossums, and rabbits.
3. Transmission. Rabies is most commonly transmitted through the bite of an infected animal, by exposure of open wounds or mucous membranes to the saliva of an infected mammal, and less commonly by aerosols. Although rare, transmission has been reported to occur by inhalation of aerosols (created from saliva, secretions, and excretions of infected bats in bat-roost sites (buildings, caves, and mines).
4. Clinical signs in animals. Incubation period is highly variable in wild animals. Abnormal behavior can manifest as the “dumb form” – depression, incoordination, or lethargy; or the “furious form” – agitation, aggression, agitation, charging, chewing on its body, or snarling. Terminal stages include seizures, coma, and death.
5. Symptoms in humans. The incubation period can range from days to years. Symptoms of rabies in humans include discomfort or pain at the wound site, fever, headache, malaise, apprehension, difficulty swallowing, muscle spasms, and paralysis. As the disease progresses, victims may become disoriented and agitated and begin hallucinating. Death due to respiratory arrest occurs within days of symptoms onset.

Steps to minimize risk and/or prevent exposure follow:

1. Minimize human infection by prophylactic (pre-exposure) rabies vaccination for anyone at risk of exposure. Follow current public health rabies vaccination protocols.
2. Wear appropriate PPE, such as light cut-resistant gloves, when handling animals.
3. Bite wounds should be cleaned promptly with soap and water; and the victim should seek medical attention. The victim should receive post-exposure rabies vaccination,

especially if the suspected animal cannot be rabies tested. Record the exposure date, location, and circumstances.

53.73c - Plague (Reportable Disease)

1. Agent. *Yersinia pestis* (bacteria).
2. Host. Rodents are common animal reservoirs - rats, mice, squirrels, prairie dogs, rabbits, and free-ranging domestic cats.
3. Transmission. Plague is transmitted through bites of infected fleas carried by host species and by direct contact with and inhalation or ingestion of tissues or body fluids of infected animals. Known endemic widespread prevalent regions are in the southwestern U.S. but cases have also been reported in California, Nevada, and Oregon; and Africa, Asia, and South America.
4. Clinical signs in animals. Signs include sudden large die-offs in rodent or rabbit species, involving rapid death often without gross lesions or clinical signs. Disease presence requires laboratory testing and diagnosis.
5. Symptoms in humans. The incubation period is two to six days with various manifestations:
 - a. Bubonic plague. Swollen, tender lymph nodes located in axillary region (armpit); inguinal region (groin); and neck.
 - b. Septicemic plague. Fever, chills, extreme weakness, abdominal pain, shock, and possibly bleeding into the skin and other organs. Skin and other tissues may turn black and die, especially on fingers, toes, and the nose.
 - c. Pneumonic plague. Fever, headache, weakness, and a rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody expectorate; respiratory failure and shock leading to death (> 50%).

Steps to minimize risk and/or prevent exposure follow:

1. Control rodents around homes and other human habitations; use flea control products for pet cats/dogs; wear gloves and other PPE when handling potentially infected animals; and use insect repellent.
2. Seek immediate medical attention if exposed, including early treatment with prescribed antibiotics.
3. Seek veterinary care if a pet becomes ill, especially in endemic areas.

53.73d - Tularemia (Reportable Disease)

1. Agent. *Francisella tularensis* (bacteria).

2. Hosts. Most are common small mammals such as muskrats, rabbits, and rodents.
3. Transmission. Bacteria is shed in aerosolized urine, feces, and tissues of infected animals by direct contact, inhalation, and ingestion; bites from ticks, flies, and other arthropod vectors can also transmit.
4. Clinical signs in animals. Sudden death in individual animal or rapid die-offs are common; some animals may exhibit depression or lethargy before death.
5. Symptoms in humans. Flu-like illness to include chills, fever, headache; possible vomiting.

Steps to minimize risk and/or prevent exposure include the following:

1. Wear proper PPE: long pants and long-sleeved shirts, socks, and boots.
2. Use insect repellent.
3. Wear gloves, goggles, and mask when handling dead animals.

53.73e - Lyme Disease (Borreliosis)

1. Agent. *Borrelia burgdorferi*.
2. Host. Hosts include mice, squirrels, and other small animals.
3. Transmission. The disease is transmitted through tick bites. In most cases, the tick must be attached for 36 to 48 hours or more before the Lyme disease bacterium can be transmitted. All life stages can be infective. Common tick species include the following:
 - a. *Ixodes scapularis* (eastern black-legged or deer tick).
 - b. *Ixodes pacificus* (western black-legged tick).
4. Clinical signs in animals (dogs). Common signs are fever (103°-105°F), lameness, lethargy, loss of appetite, swollen joints, and swollen lymph nodes. Uncommonly, some dogs have developed severe progressive kidney disease as sequelae to Lyme disease. Seek veterinary medical attention for treatment.
5. Symptoms in humans. Symptoms include chills, fever, fatigue, headache, joint and muscle aches, and swollen lymph nodes. A characteristic skin rash called erythema migrans/EM (“bull’s eye”) occurs in approximately 70 percent of infected people in about three to 30 days after a tick bite. If left untreated, infection can spread to joints, the heart, and the nervous system causing arthritis, cardiac disease, facial palsy, and memory loss.

6. Another tick bite rash with a very similar appearance to EM occurs with Southern Tick-associated Rash Illness (STARI) but is not Lyme disease.

Steps to minimize risk and/or prevent exposure include the following:

1. Use appropriate tick repellent products on skin and clothing per label instructions.
2. Find and remove ticks from pets and from your body commonly found in the armpits, groin, and scalp areas.

53.73f - Echinococcosis

1. Agent. Tapeworms, *Echinococcus granulosus* and *E. multilocularis*.
2. Hosts. The tapeworm complete lifecycle requires an intermediate host (for larval stages) and a definitive host (adult worms).
 - a. Intermediate hosts are prey species –caribou, deer, moose, domestic livestock (pig, sheep), and rodent species.
 - b. Definitive hosts are carnivores -coyotes, foxes, wolves, and dogs.
3. Transmission. Adult tapeworms reside in the intestines of the definitive hosts, and tapeworm eggs are shed in the feces. Intermediate hosts ingest these eggs while foraging, and the larval tapeworms hatch to form tissue cysts in the intermediate hosts (prey species). When carnivores consume the prey species, the larval worms develop to adult worms in the carnivore intestines. Humans can become infected with *E.granulosus* and *E.multilocularis* by ingestion of tapeworm eggs (fecal contamination).
4. Clinical signs in animals are as follows:
 - a. Definitive hosts (carnivores) - generally no overt clinical signs are observed; tapeworm eggs can be found in feces.
 - b. Intermediate hosts - weakness, debilitation, an enlarged abdomen, and death; larval cysts are found in the liver or lungs of infected animals.
5. Symptoms in humans. Tapeworm eggs hatch to release larval worms that migrate in the body to form cysts in the liver, lungs, and brain. Symptoms that may not develop for years include abdominal pain, blurred vision, cough, enlarged liver, fever, headache, and jaundice.

To minimize risk and/or prevent exposure, avoid fecal contamination with tapeworm-infected carnivore feces; wear gloves and proper PPE when handling definitive host carnivores (coyotes, foxes, wolves, and dogs).

53.73g - Highly Pathogenic Avian Influenza (Reportable Disease)

1. Agent. Orthomyxovirus - Highly Pathogenic Avian influenza virus (Type A) - H5 and H7 viral strains.
2. Hosts. Hosts are most common in wild waterfowl (dabbling ducks, geese) as reservoir hosts; some shorebirds and raptors; and domestic pigs. Fatal infections have been reported in ferrets and large cats (tigers and leopards) fed avian influenza-contaminated poultry meat.
3. Transmission. Transmission takes place through direct contact with infected birds by inhalation or aerosolization of feather dander/dust, feces, or oral-nasal secretions; cross contamination of mucous membranes (eyes and nasal mucosa); or ingestion of undercooked infected poultry products.
4. Clinical signs in animals are as follows:
 - a. Wild birds - often sudden death without clinical signs. Requires laboratory diagnosis.
 - b. Domestic birds/poultry - sudden onset of mortality in flock that may include bloody feces, bruising along legs, coughing, gasping respiratory sounds, ruffled feathers, or swollen heads (combs and wattles).
 - c. Other animals - fever, depression, lethargy, loss of appetite, and sudden death.
5. Symptoms in humans. Avian influenza is a RARE disease in humans and a very rare cause of death. If infected, symptoms may include conjunctivitis, cough, difficulty breathing, fever, muscle aches, and pneumonia; practitioners must differentiate and diagnose from seasonal human flu.

Steps to minimize risk and/or prevent exposure include the following:

1. Wear proper PPE (face mask or respirator, gloves, and goggles) when handling infected or dead birds.
2. Get an annual seasonal flu vaccine that may have some cross-protection to avian H5/H7 influenza strains and/or lessen the severity of infection.

53.73h - West Nile Virus (Reportable Disease)

1. Agent. Arthropod-borne virus (Arbovirus) group – Flavivirus genus – West Nile virus.

2. Host. Most common bird species are corvids (American crows, blue jays, fish crows) and raptors (hawks, owls); deer, horses, humans, and many species of mammals and reptiles are dead-end hosts (do not amplify the virus).
3. Transmission. Arthropod vectors include mosquitos (Culex species) and Hippoboscids flies that transmit virus in their salivary glands when biting and sucking blood.
4. Clinical signs in birds and other animals. Neurologic signs include ataxia, blindness, depression, general weakness, emaciation, inability to fly, lethargy, seizures, and death.
5. Symptoms in humans. Many infected people may be asymptomatic (80 percent); others have “flu-like symptoms” to include fatigue, fever, headache, joint pain, muscle aches, and neck stiffness. The illness can progress to neurologic disease - encephalitis, meningitis, paralysis, and poliomyelitis, and death.

Steps to minimize risk and/or prevent exposure include the following:

1. Wear protective clothing,
2. Use insect repellents on skin and clothing, following label directions.
3. Eliminate mosquito breeding areas and other vector control programs.

54 - Environmental Hazards

54.01 - References

1. Gaskill, Steve, and Sharkey, Brian J. 2009. Fitness and Work Capacity, Second Edition. 9651-2812-MTDC. Missoula Technology and Development Center, Forest Service.
2. National Fire Protection Association. Lightning Protection Code 780.

54.1 - Radiation

See FSM 6740 for specific guidance and agency requirements around radiation resources.

54.2 - Solar Ultraviolet Radiation

Radiation intensity varies with numerous factors, including time of day, altitude, latitude, and season. About 80 percent of the ultraviolet (UV) rays reaching the Earth's surface do so between 9 a.m. and 3 p.m., with peak hours of exposure generally between 10 a.m. and 2 p.m. Employees who spend much of their workday outside should be cautioned about the short- and long-term risks of UV exposure.

To minimize UV exposure, employees should observe the following:

1. Keep exposed skin covered by wearing a hat, a bandanna, and a long-sleeved shirt (with sleeves rolled down and collar turned up).
2. Wear sunglasses that filter out 100 percent of the UV rays. The use of non-UV protected sunglasses or photogrey glasses can increase the chance of UV damage to the retina and are not recommended.
3. Provide and use protective sunscreen cream, oil, lotion, and lip balm when appropriate.
4. When possible, stay indoors during the peak exposure time in the summer or find shady worksites.
5. Alter work schedules, where appropriate, to avoid peak summer exposure.
6. Where appropriate, alternate workers during the summer months to reduce exposure.

54.3 - Extreme Weather Conditions

Employees should use the buddy system while training and working in extreme weather conditions.

54.31 - Working in Hot Conditions

Individual differences in heat tolerance are related to drugs and medication, fatigue, fitness, hydration, and illness.

Heat stress occurs when the body's core temperature rises beyond safe limits. Sweat evaporation is the body's main line of defense against heat. As sweat evaporates, it cools the body. When water lost by sweating is not replaced, the body's heat controls break down, and body temperature climbs dangerously. Exposure to physical exertion, especially in high heat and high humidity conditions, can contribute greatly to heat-related emergencies (54.31, ex. 01 and 54.31, ex. 02).

Employees and Supervisors should observe the following:

1. Fit workers adjust or acclimate to work in the heat much faster than unfit employees. Be especially mindful to acclimate employees to changing conditions the first two to three days.
2. Schedule the hardest work during the cooler hours of the day. Set a moderate work pace. As the temperature increases, stop for frequent rest periods of at least 15 minutes. Relax in cool locations where possible.

3. Always have an adequate water supply available and ensure that employees are getting their needed liquids. (54.31, ex. 03).
4. To prevent dehydration, employees should observe the following:
 - a. Drink eight to 16 ounces (200 to 400 milliliters) of water before work.
 - b. Take frequent drinks during each hour of work (one quart or one liter per hour).
 - c. Continue replacing fluids throughout the evening.
 - d. Limit caffeine drinks, such as coffee, energy drinks, or sodas.
 - e. Avoid alcoholic drinks.
 - f. During physical exertion, employees should periodically check their urine color to determine hydration levels (54.31, ex. 04).
5. Provide well-planned meals and healthy snacks, which are vital to maintain work capacity and to avoid heat disorders through adequate replacement of water, salt, and potassium. Carbohydrate/electrolyte beverages can help maintain energy and work output during long periods without food or snacks. Include potassium-rich foods, such as bananas and citrus fruits. High-protein foods (such as meat) increase metabolic heat production and water loss and are not recommended.
6. Prevent sunburn by wearing lightweight, light-colored loose clothing, which allows air to circulate and sweat to evaporate and offers protection from direct sun. Bare skin absorbs the sun's radiant heat and raises body temperature.
7. During periods of continued extreme temperatures (90 °F/32 °C or above), ensure that Supervisors monitor employees and that employees watch each other for signs of heat-stress disorders, including heat cramps, heat exhaustion, and heatstroke.
 - a. Heat cramps are muscle spasms that result from heavy sweating during physical exertion where the body loses significant amounts of water and salt; they are identified by muscle pains and cramps in the abdomen, arms, and calves. Heat cramps are generally caused by inadequate consumption of fluids or electrolytes during exertion. To prevent heat cramps, one may drink electrolyte solutions during exercise or strenuous work or eat potassium-rich foods like bananas and apples. When heat cramps occur, the affected person should avoid strenuous work and exercise for several hours to allow for recovery.
 - b. Heat exhaustion is characterized by heavy sweating, rapid pulse, fatigue, weakness, and collapse as a result of the body becoming overheated. The skin becomes pale, cool, and clammy and is accompanied by nausea, dizziness, a throbbing headache, breathing problems, and diarrhea. Without prompt treatment,

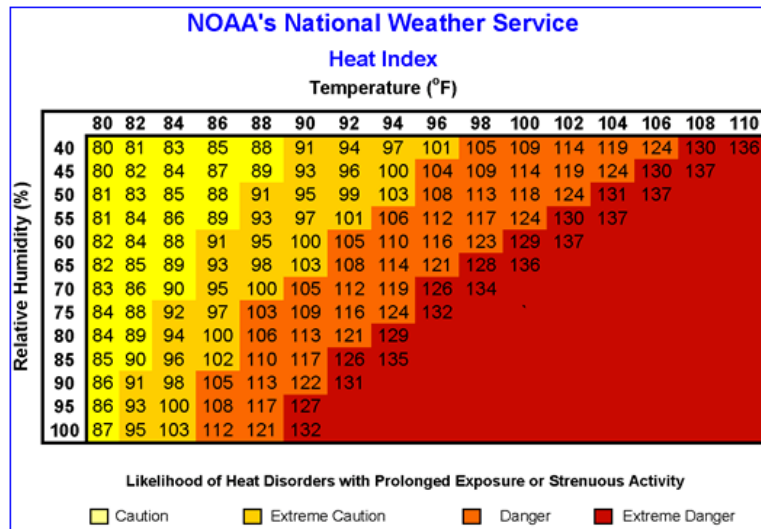
Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

heat exhaustion can lead to heatstroke. Recommended actions include moving to a cool shady place or air conditioned room or vehicle; lying on your back with your feet raised above heart level; drinking cool fluids such as water or sports drinks; and loosening your clothing. If possible, take a cool shower, soak in a cool bath, or put towels soaked in cool water on the skin. If there is no improvement within one hour, quickly seek medical attention.

c. Heatstroke is a medical emergency that requires immediate medical treatment. Heatstroke is caused by the body overheating, usually as a result of prolonged exercise or physical exertion in high temperatures. Heatstroke can occur if the body temperature rises to 104°F or higher. Symptoms are confusion, a high body temperature, hot (often dry) skin, a rapid pulse, convulsions, loss of consciousness, and coma. Lack of sweating is one sign of imminent heatstroke. Cool the body down quickly. Administer fluids and transport the victim to a medical facility as quickly as possible. Untreated heatstroke may damage the brain, heart, kidneys, and muscles. As treatment is delayed, the risk of serious complications, including death, are increased.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

54.31 - Exhibit 01



54.31 - Exhibit 02

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement precautions and heighten awareness
103°F to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018










54.31 - Exhibit 03



54.31 - Exhibit 04

AM I HYDRATED?

Urine Color Chart

1		If your urine matches these colors, you are drinking enough fluids
2		Drink more water to get the ideal color in Shade 1 and 2.
3		Dehydrated
		
4		You may suffer from cramps and heat-related problems
5		Health risk! Drink more water.
6		Health risk! Drink more water.
7		Health risk! Drink more water.
8		Health risk! Drink more water.

54.32 - Working in Cold Conditions

Employees should observe the following:

The best defense against frostbite and hypothermia is to avoid exposure. Recognize hypothermia-producing weather and prepare for it. Prevention is the best tool. Always check weather conditions and be familiar with the area before trips. Each person should carry a survival kit.

Exposure to hazards associated with the cold can occur when employees are inside (such as cold storage areas and tree coolers) as well as outside. Factors that put employees more at risk include medical conditions such as allergies or poor circulation; taking medications such as sedatives; or lifestyle choices that reduce circulation, such as smoking or drinking alcohol.

All persons who work outdoors in cold climates are encouraged to have cold weather survival training. Where work or activities are planned during extremely cold weather, a risk assessment (RA) should address the specific conditions anticipated, including essential PPE. Key winter survival items are as follows:

1. Adequate rest.
2. Always anticipate bad weather. Carry additional warm clothing. Dress for the conditions in layers of loose, dry clothes: polypropylene or wool underneath with windproof and waterproof material on top. Ensure that face, feet, hands, head, and neck are covered and well protected.
3. Keep active to maintain the body's metabolism and keep your body temperature high.
4. Prevent dehydration by drinking warm water. Avoid drinking cold water, ice, or snow. Avoid caffeinated beverages.
5. Set up camp early and prepare for dropping night temperatures. Find shelter and firewood before dark.
6. Eat balanced meals and high energy snacks.
7. Travel in pairs as a minimum. Never travel alone in isolated areas. A Line Officer or other competent person shall approve and document the assignment of employees to work alone in undeveloped areas.

54.32a - Frostbite

Employees should observe the following:

Frostbite is generally brought on by direct contact with a cold object or exposure of a body part to cold air. Body parts most often affected are the nose, ears, cheeks, fingers, and toes. Test for

circulation and sensation regularly by wiggling fingers and toes. Watch for signs of frostbite in yourself and co-workers. Major factors causing frostbite are wind and water chill.

1. Frostbite may develop slowly and go undetected until the affected part or parts become white. As the cooling process continues, numbness replaces any sensation of cold or discomfort.
2. If the early stages of frostbite go untreated, the affected part or parts take on a waxy appearance and feel frozen to a gentle touch; however, when the skin is pressed firmly, it feels soft and pliable beneath the frozen area. At this stage of frostbite, the affected person must be moved to a dry covered area and the affected part or parts gently handled. If transportation to a hospital is delayed, protect the skin from further exposure; get out of the cold and gently rewarm frostbitten areas by soaking in warm water for 15 to 30 minutes. If there's a chance affected areas will freeze again, do not thaw them. Where possible, don't walk on frostbitten feet or toes. Always follow up with medical care.
3. The next step is referred to as deep frostbite. Muscles, bones, deep blood vessels, and organ membranes can become frozen. The affected part becomes blotchy blue or gray, and the tissue feels frozen on the surface and when pressed firmly. For this frostbite stage follow these steps:
 - a. Transport the victim immediately to a hospital for medical care.
 - b. Gently cover the affected part or parts with dry blankets or clothing.
 - c. Do not rub or chaff the frostbitten part or parts.
 - d. If the tissue is frozen, keep it frozen until care can be initiated.
 - e. Do not initiate thawing procedures if there is any danger of refreezing. Keeping the tissue frozen is less dangerous than submitting it to refreezing.

54.32b - Hypothermia

Employees should observe the following:

Hypothermia is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 98.6 °F (37 °C). Hypothermia occurs as your body temperature falls below 95 °F.

When your body temperature drops, your heart, nervous system, and other organs can't work normally. Left untreated, hypothermia can eventually lead to complete failure of your heart and respiratory system and eventually to death. Hypothermia is often caused by exposure to cold weather or immersion in cold water. Primary treatments for hypothermia are methods to warm the body back to a normal temperature. Hypothermia usually occurs on a cold, wet windy day

with temperatures at or above freezing. Most hypothermia cases develop between 30 °F (-1 °C) and 50 °F (10 °C). (54.32b, ex. 01).

Hypothermia symptoms begin with feeling cold, experiencing pain in the extremities, and shivering as the body tries to raise its temperature. Other symptoms include slurred speech or mumbling; slow, shallow breathing; weak pulse; clumsiness or lack of coordination; drowsiness or very low energy; confusion or memory loss; and loss of consciousness. Hypothermia victims are usually unaware of their condition because the symptoms often begin gradually. The confused thinking associated with hypothermia may prevent self-awareness and also lead to risk-taking behavior.

Hypothermia first-aid steps follow:

1. Seek medical attention or transport the person to the nearest medical facility.
2. Be gentle. Limit movements to only necessary ones. Don't massage or rub the person. Excessive, jarring, or vigorous movements may trigger cardiac arrest.
3. Move the person out of the cold, if possible. If that isn't possible, shield him or her from the cold and wind and keep him or her in a horizontal position.
4. Remove wet clothing. Cut away clothing if necessary to avoid excessive movement.
5. Cover the person with blankets. Use layers of dry blankets or coats to warm the person. Cover the person's head, leaving only the face exposed.
6. Insulate the person's body from the cold ground. If outside, lay the person on his or her back on a blanket or other warm surface.
7. Monitor breathing. A person with severe hypothermia may appear unconscious, with no apparent signs of a pulse or breathing. If the person's breathing has stopped or appears dangerously low or shallow, begin CPR.
8. Provide warm beverages. If the affected person is alert and able to swallow, provide a warm, sweet, nonalcoholic, non-caffeinated beverage to help warm the body.
9. Use warm, dry compresses. Use a first-aid warm compress (a plastic fluid-filled bag that warms up when squeezed) or a makeshift compress of warm water in a plastic bottle or a dryer-warmed towel. Apply a compress only to the neck, chest wall, or groin. Don't apply a warm compress to the arms or legs. Heat applied to the arms and legs forces cold blood back toward the heart, lungs and brain, causing the core body temperature to drop. This can be fatal.
10. Don't apply direct heat. Don't use hot water, a heating pad, or a heating lamp to warm the person. The extreme heat can damage the skin, or even worse, cause irregular heartbeats so severe that they can cause the heart to stop.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
 Chapter 50 - Employee Safety, Security, and Health
 Amendment: 6709.11-2018-1
 Effective date: December 03, 2018

54.32b - Exhibit 01

		Temperature (F)																	
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	
Frostbite occurs in 15 minutes or less																			

54.33 - Lightning and Thunderstorms

The most dangerous period for thunderstorms with cloud-to-ground lightning is from March through August. The mature stage of the storm may be marked on the ground by a sudden reversal of wind direction, a noticeable rise in wind speed, and a sharp drop in temperature. Heavy rain, hail, and lightning occur only in the mature stage of a thunderstorm. Keep informed; know what the storm is doing. During a thunderstorm, behave as follows:

Employees should know and observe outdoor lightning safety awareness:

1. No place outside is safe when thunderstorms are in the area.
2. If you hear thunder, lightning is close enough to strike you.
3. When you hear thunder, immediately move to a safe shelter: a substantial building with electricity or plumbing or an enclosed, metal-topped vehicle with windows up.
4. Stay inside a safe shelter at least 30 minutes after you hear the last sound of thunder.

Actions to take during a thunderstorm are as follows:

1. Stay in your vehicle unless it is metal-tracked, has a nonmetal top, or is open.
2. If you are on a metal-tracked vehicle, dismount and seek appropriate shelter. Get away from lakes, ponds, streams, swimming pools, and water tanks. Avoid athletic fields, golf courses, parking lots, and tennis courts.
3. Take shelter in a building if one is available. Choose a building with lightning protection in preference to a small, unprotected building. Close the doors and windows if possible. If that is not possible, stay away from open doors and windows and areas on top of buildings. Stay away from fireplaces, metal pipes, radiators, sinks, and stoves.
4. If no buildings are available, your best protection is a cave, canyon, ditch, tunnel, or head-high clumps of trees in open forest areas.
5. If sheltering under a steel bridge, never touch the steel and never sit or stand on damp ground.
6. When there is no shelter, avoid tall objects such as lone trees. If only isolated trees are nearby or if you are in open country, the best protection is to make yourself as small a target as possible. Drop to your knees, bend forward with your hands resting on your knees, and keep a distance of twice the height of the nearest tree between you and the tree. To minimize the flow of the current, keep your feet together. Keep away from wire fences, telephone lines, electrically conductive objects, and railroad tracks.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

7. Avoid hilltops, ledges, ridgetops, rock out-croppings, wide-open spaces, and sheds or shelters in exposed locations. Avoid grouping people together.
8. Move away from horses and stock.
9. Turn off generators and electrical equipment.
10. Put down all tools. Caulk boots are particularly good grounding agents and should be removed.
11. Do not handle flammable materials in open containers.
12. Do not use plug-in electrical equipment, plumbing fixtures, radios, or telephones,
13. If boats are in use, have them docked. Get out of boats and away from the water.
14. Ground and anchor all aircraft.
15. Advise crew members that if they feel an electrical charge, their hair stands on end, or their skin tingles, a lightning strike may be imminent.

Emergency response measures after a lightning-strike follow:

1. Persons injured by lightning may receive a severe electrical shock and burns, including entry and exit wounds. These individuals carry no electrical charge after exposure to lightning and can be touched safely. Lightning-strike victims may suffer respiratory and/or cardiac arrest. Administer CPR immediately if needed and first aid as required.
2. An individual in full-cardiac arrest is a medical emergency and must be transported to an advanced life-support medical facility as quickly as possible.
3. Where there are multiple lightning-strike victims, render emergency medical treatment first to individuals who are unresponsive and next to those with vital signs who exhibit the most life-threatening injuries.

54.34 - Tornadoes

A severe thunderstorm may spawn a tornado, which is a violently rotating column of air that descends from a cloud system. Most tornadoes occur during the mid-afternoon or early evening (3-7 p.m.) and move from the southwest to the northeast at speeds ranging from stationary to 70 miles an hour.

Employees should observe the following:

While hail may or may not precede a tornado, the area adjacent to large hail is often where strong to violent tornadoes are most likely to occur. When large hail begins to fall, a tornado may be nearby. Seek appropriate shelter. Once the hail has stopped, remain in a protected area until the storm has moved away, usually 15 to 30 minutes after the hail ceases. During a tornado, behave as follows:

1. Do not attempt to flee to safety by vehicle. Seek sturdy shelter, such as a building; a ditch or ravine offers better protection than a vehicle.
2. Stay away from windows, exterior doors, and outside walls.
3. Go to storm cellars or well-constructed basements, which offer the greatest protection from tornadoes; or to small interior rooms, such as a closet or bathroom, which provide safety from flying debris and are less likely to experience roof collapse.
4. If caught in a timbered area during periods of high winds or immediately after a windstorm, get into a natural opening large enough to give protection from falling trees and limbs.

54.35 - Flash Floods

Flooding occurs seasonally when rains, coupled with melting snows or torrential rains associated with tropical storms, drain into small tributaries and fill river basins with too much water, too quickly. Flash flood waves can roll boulders, tear out trees, destroy buildings and bridges, and create new channels. When a flash flood is imminent, employees should act quickly as follows:

1. Do not camp or park your vehicle along streams and washes, particularly during threatening conditions.
2. Avoid areas subject to flooding. This includes canyons, dips, low-lying areas, and washes.
3. Avoid already flooded and high-velocity flow areas. Do not attempt to cross a swift flowing stream on foot where water is above your knees.
4. Do not attempt to drive over a flooded road where you do not know the depth of water before crossing. The roadbed may not be intact under the water.
5. If your vehicle stalls, abandon it immediately and seek higher ground.
6. Be especially cautious at night when it is harder to recognize flood dangers.

54.4 - Altitude-Related Problems

High altitude (8,000 feet or 2,438 meters and higher above sea level) affects a person's ability to take in, transport, and utilize oxygen, thus affecting work capacity. During acclimation, employees working in high altitudes should work slower and take frequent breaks to avoid excessive fatigue. These employees should eat a high-carbohydrate diet for added energy and take special care to maintain hydration since altitude hastens fluid loss.

Individuals vary in their ability to acclimatize; some adjust quickly without discomfort while acute mountain sickness (AMS) develops in others.

AMS commonly occurs above 8,000 feet and presents itself as a collection of symptoms such as dehydration, exhaustion, flu-like illness, or hangover. The incidence and severity of AMS depend on the rate of ascent, altitude attained (especially the sleeping altitude), length of exposure, level of exertion, and inherent physiologic susceptibility. Treatment for AMS includes descending to a lower altitude and administering oxygen, if available.

Other altitude-related problems include a decrease in temperature and the effects of cold; ultraviolet penetration that increases the risk of sunburn, skin cancer, and snow blindness.

55 - Temporary Camps

The requirements for health and safety in temporary labor camps, which accommodate large numbers of workers and can be reached by highway or forest road, differ from those for remote-site camps, which serve only a few employees and typically can't be reached by road.

The following direction concerning water supply, sanitation, and food service operations applies to a large temporary labor camp. Safety hygiene and other concerns of remote camps are addressed in section 55.12.

55.01 - Authority

The authority for sanitation and temporary camps is in Title 29, Code of Federal Regulations, sections 1910.141 and 1910.142.

55.06 - Reference

Red Cross - Youth Camp Director's Safety Guide. Swimming and Water Safety. Stock No. 321147 and Stock No. 321215. National Safety Council, 425 N. Michigan Ave., Chicago, IL 60611.

55.1 - Procedures

Line Officers shall ensure fire prevention/suppression and emergency evacuation procedures are identified.

1. Fire extinguishers must be provided, located, identified, and readily accessible to employees.
2. Smoke detectors must be provided where appropriate.

55.11 - Temporary Camp Requirements

55.11a - Water Supply

Line Officers shall ensure the following is addressed:

1. Provide an adequate and convenient water supply approved by the appropriate health authority for drinking, cooking, bathing, and laundry purposes.
2. Never assume water is safe. As a general policy, use only potable water from a tested and approved source.
3. Store water in safe, properly labeled containers.
4. Ensure that drinking water is dispensed in individual sanitary containers, such as paper cups, if fountains are not available or bottled water is provided. One-for-all canteens or drinking cups and other common utensils are prohibited (29 CFR 1910.142). Where single-service cups are supplied, provide both a sanitary container for unused cups and a receptacle for used cups.

55.11b - Other Requirements

Line Officers shall ensure the following is addressed:

1. Install all cooking, heating, and water heating equipment in accordance with State and local ordinances, codes, and regulations governing such installations.
2. If a camp is used during cold weather, provide adequate heating equipment.
3. Provide beds, bunks, cots, and suitable storage facilities, such as wall lockers, for clothing and personal effects.
 - a. Ensure that each room for sleeping contains at least 50 square feet (15-1/4 m²) of floor space per occupant and that shelters have at least seven-foot (two m) ceilings.
 - b. Place beds no closer than 36 inches (1 m), both laterally and end-to-end, and at least 12 inches (1/3 m) off the floor.
 - c. Space double-deck bunks no closer than 48 inches (1-1/5 m), both laterally and end-to-end. The minimum amount of clear space required between the upper and lower bunk is 27 inches (1/2 m). Triple-deck bunks are prohibited.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

4. Ensure that living quarters have windows. The window area must total at least one-tenth of the floor area. Half of the windows must open for ventilation.
 - a. Doors and windows must be screened with 16-mesh material.
 - b. Doors must be equipped with self-closing devices.
5. Where personnel cook, live, and sleep in the same area, provide 100 square feet (30-1/2 m) per person.
6. Provide sanitary facilities for storing and preparing food.
7. Ensure that floors are level and constructed of asphalt, concrete, or wood. Wooden floors must be smooth and tight and kept in good repair.
 - a. Wooden floors must be elevated at least one foot (1/3 m) above the ground. Back filling around outer walls is permissible in areas subject to extreme temperatures.
 - b. Steps must have no more than an eight-inch (204 mm) rise and nonslip treads. Where four or more steps are present, handrails are required.
8. Ensure that each camp has a first-aid kit(s) available with appropriate medical supplies to effectively respond to the types of medical emergencies anticipated. At least one person must be certified in first aid/CPR.
9. Provide for communications systems. Cellphone, radio, or telephone communications with the field-crew headquarters or other links to emergency dispatch or responders must be maintained. Have a daily contact schedule for every camp. Include measures that will be taken in case a reporting schedule is missed.
10. Where camps are near roads, provide a vehicle for emergency use.

55.11c - Camp Sanitation

Line Officers shall ensure employees observe the following:

Construct, operate, and maintain temporary camps according to national and local public health standards (29 CFR 1910.141 and 1910.142).

When living in government camps or quarters, maintain reasonable standards of personal hygiene and housekeeping. Take effective measures to prevent flies, rodents, and other insects and animals from infesting camps. Keep all places clean to the extent that the nature of the work allows.

1. Place central refuse bins on a hard surface to prevent tipping.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

2. Collection must be frequent enough to prevent overflow, fly breeding, rodent and vermin infestation, and odors. Open burning of rubbish and debris is discouraged and is subject to local ordinance.
3. Clean and sanitize cabins and tents weekly or more often as needed.
4. Clean and sanitize kitchens and restrooms daily.
 - a. Always maintain a supply of soap, hot water, clean towels, and toilet paper.
 - b. Keep showers, including mats, clean; disinfect them daily.
5. Keep subsistence supplies carefully and properly stored and protected from ants, flies, rodents, and weather.
6. Where toilet facilities are provided for employees, proceed as follows:
 - a. Maintain natural or artificial lighting at all hours of the day and night.
 - b. Keep toilet rooms sanitary and clean them daily.
 - c. Where a sewer is available, connect all camp sewer lines and floor drains from buildings to the sewer.
 - d. Keep toilet facilities supplied with toilet paper and ensure that the number of toilets complies with OSHA standards (29 CFR 1910.142 (d)). As a general rule, provide one toilet for every 15 people but never less than two per camp.

55.11d - Food and Food Service Operations

Line Officers shall ensure the following is observed:

A properly constructed kitchen and dining hall must be adequate in size and separate from sleeping quarters and lavatories, with no openings leading from living or sleeping quarters into the kitchen or dining hall.

1. Operate food service facilities in accordance with sound hygienic principles. When all or part of the food service is provided, ensure the food dispensed is wholesome and free from spoilage and is processed, prepared, handled, and stored to protect from contamination.
2. Ensure that cooks meet State and local health requirements.
 - a. Do not permit any person with a communicable disease, including colds, to prepare, cook, serve, or otherwise handle food, foodstuffs, or materials in any kitchen

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

- or dining room. Food handlers shall have clean hands and fingernails and be free from open sores.
- b. Ensure that persons wash hands thoroughly with soap and water for a minimum of 20 seconds before handling food and engaging in food preparation.
 - c. To prevent food contamination, ensure that persons working in kitchens and dining halls wear hair nets (or caps) and clean clothes.
3. Keep kitchen areas and food storage facilities free of insects, pests, and rodents. Windows, door screens, and rodent-proof food storage facilities are basic requirements.
- a. Ensure that floors and food preparation surfaces are cleaned daily.
 - b. Use different cutting boards for raw and cooked foods. Plastic boards are easier to clean.
 - c. Scrub containers and utensils used in handling uncooked foods with hot, soapy water before using them with ready-to-serve foods.
4. Inspect cooking facilities frequently for general sanitary conditions and individual housekeeping standards.
- a. Inspect food storage facilities, including cabinets, coolers, freezers, refrigerators, and vaults, for cleanliness, food shelf-life, insect/rodent infestation, and spoilage. Conduct and document food storage inspections weekly.
 - b. Provide filters above grills. Clean the hoods over grills at least weekly to remove grease deposits. Equip them with an automatic fire extinguishing system or grease extractors.
5. Store all perishable food at temperatures that retard spoilage.
6. Refrigerate or freeze leftovers in small, covered shallow containers within two hours after cooking—the quicker the better. Leave airspace around containers to help assure rapid, even cooling. Individual food portions, once served, may be served again only if they are safe and uncontaminated.
- a. Thaw foods in the refrigerator.
 - b. Dispose of all contaminated, moldy, or spoiled foods immediately. Throw out all leftovers after three days.
 - c. Maintain all potentially hazardous food at safe temperatures (ex. 01), except during necessary periods of preparation and service.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

d. Place thermometers in each refrigeration unit and post the proper temperature levels near the thermometer.

(1) Keep cold foods cold (below 40°F/4°C for refrigerated foods; 0°F/-17°C for freezer foods.)

(2) Keep hot foods hot (140°F/60°C or above until ready to serve).

(3) Heat foods thoroughly: a rolling boil for gravies, sauces, soups, and other moist foods; 165°F/74°C for all other foods.

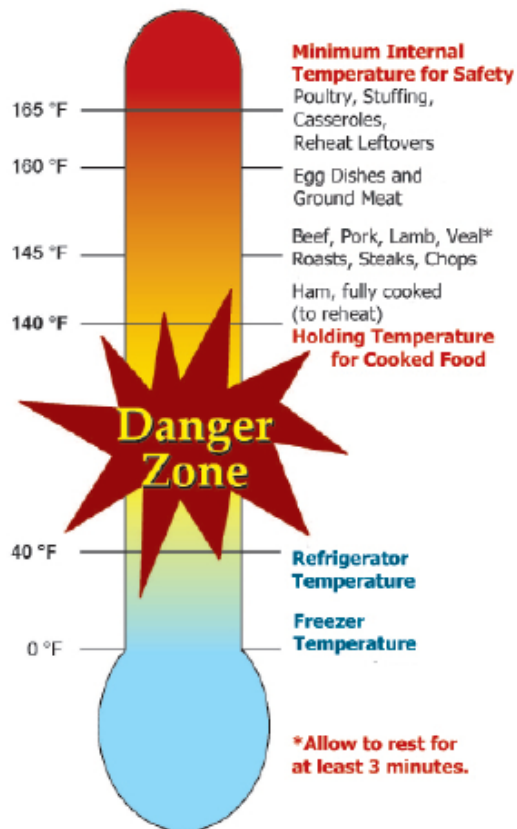
e. Limit food preparation to areas specifically designated for this purpose. Eat prepared food in specified dining areas, not in sleeping areas.

f. Unless other arrangements are made and mutually agreed upon, require each employee preparing personal meals to be responsible for cleaning cooking facilities, appliances, and personal cooking and eating utensils after the meal.

g. In cooking facilities, use or store only such toxic materials as are required to maintain sanitary conditions. Toxic materials must be identified, stored, and used only in such a manner and under such conditions that do not contaminate food or constitute a hazard to employees. Safety Data Sheets must be available and utilized for their intended purposes.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

55.11d - Exhibit 01



55.12 - Spike Camps/Remote-Sites General Campout

When work projects or activities require camping out, it is important to be well prepared.

55.12a - Preparations

During campout situations, employees should observe the following:

1. Talk to coworkers who are familiar with the area. Study maps and aerial photos of the worksites and camp locations.
2. Ensure that the crew has reliable communications and a regular check-in schedule.
3. Prepare a travel itinerary and return-time schedule.
4. Procure foodstuffs carefully: avoid glassware; consider freeze-dried foods and other nonperishables; label everything; take along bags, bottles, and sealable plastic boxes for perishables; and purchase perishables just prior to departure.
5. Train personnel in the use of specific camp equipment, such as first-aid kits; handtools; lanterns and stoves; compasses, global positioning systems (GPS), maps, and satellite emergency notification devices (SENDs) along with camp sanitation, radio operations, and survival techniques.

55.12b - Other Concerns

Employees should take appropriate steps to address the following:

1. Staff and equipment transportation.
2. Specific work or activity anticipated hazards.
3. Personal health needs.
4. Waste material disposal.
5. Camp choice and layout.
6. Weather and seasonal impacts.
7. Natural hazards such as areas subject to flash flooding, low marshy areas, overhanging cliffs, rock slides, tall grass, tree snags, and widowmakers.
8. Adequate drainage. Choose campsites with the following attributes:
 - a. Not within 200 feet (61 m) of pools, sink holes, swamps, or other surface water collection areas unless mosquito control is in effect.

- b. Free of depressions that collect water.
- 9. Sufficient space to prevent overcrowding.
- 10. Food preparation areas and sleeping quarters located at least 500 feet (152-1/2 m) from livestock areas.
- 11. Bear precautions for food storage and preparation.
- 12. Animal hazards, such as poisonous insects and snakes.
- 13. Poison ivy, oak, or sumac presence.

55.12c - Cooking Operations

Crew leaders should ensure that well-balanced meals are prepared. Because of the unique problems associated with transportation and storage of perishable foods at field camp locations, use freeze-dried, dehydrated, and other specially prepared food when possible.

- 1. Cooking area. Choose a clean and reasonably flat spot for food preparation and cooking.

Do not place cooking stoves inside tents. Use fly or tarps for protection from the weather.

If using charcoal, have regular starter fuel available. Never use gasoline or campstove fuel.

- 2. Meal preparation. Provide a wash area for cooks and kitchen helpers, complete with hot water, soap, and towels. Spread plastic sheets over food preparation areas and keep them clean. Food handler and helper personal cleanliness is essential. Contamination under field conditions can quickly become a serious health threat.

Open only the quantities of canned or sealed foods needed for each meal. Consume perishables as soon as possible. Cook all foods thoroughly to kill bacteria. Serve food hot.

- 3. Cooking utensils. Keep utensils clean. Store utensils in closed contamination-free containers until used. Never set dirty pots or containers on the food preparation surface. Use gloves or tongs when handling hot pots.

- 4. Food storage and serving. Store all unopened containers in the kitchen storage area. Store all nonperishable foods in resealable plastic containers.

Keep the food serving area clean at all times. Never serve food with your fingers. Use disposable cups, eating utensils, and plates whenever possible.

55.12d - Food Rations

Employees should consider the following:

A wide variety of freeze-dried foods eliminate the concern for spoilage and should be considered for supplementing food supplies.

1. Inspect canned foods and emergency rations annually and before use. Open and inspect (10 percent random sample) rations held in dry storage (40°F to 65°F or 4°C to 18°C) that are three years old. If storage conditions are unknown or dry storage is not within the 40°F to 65°F range, inspect rations more often. Rations exposed to temperatures above 90°F (32°C) can spoil in a few weeks or within one year, depending on storage conditions. Destroy rations after the fourth year. Destroy canned food stored in an unheated building that has been subject to freezing and thawing.
2. Destroy any canned food showing evidence of damage or spoilage, regardless of the expiration date.
 - a. Dented, leaky, rusted, swollen, or weakened cans.
 - b. Contents with a flat or sour taste or mold growth.
3. If any doubt exists about the safety of canned rations or other foods, destroy them. Always check the packing date and advise users to closely examine the contents before eating. Destroy food that is abnormal in appearance, odor, or taste.

55.12e - Water Purification of Undeveloped Sources

All undeveloped sources must be considered contaminated and unsafe for drinking water.

For field situations, employees shall provide or obtain safe drinking water through the following:

1. When available, use water from sources that comply with public water system standards.
2. Use bottled water.
3. Use a field water filter or purifier.
4. Boil water as follows:
 - a. Strain water through a clean cloth to remove sediment or floating matter.
 - b. Boil water vigorously for at least three to five minutes.

Forest Service Handbook 6709.11 – Health and Safety Code Handbook
Chapter 50 - Employee Safety, Security, and Health
Amendment: 6709.11-2018-1
Effective date: December 03, 2018

- c. Aerate to improve taste by pouring water back and forth from one clean container to another several times.
- 5. Sterilize canteens before each refilling in the following manner (unless each person has one for personal use):
 - a. Submerge canteens in a solution of liquid laundry bleach and water ratio 1:100 (one capful per gallon of water).
 - b. Keep canteens submerged for a minimum of one hour (canteens must be completely filled with solution).
 - c. Rinse thoroughly with clean water.

55.12f - After-Work, Organized Swimming Activities

Line Officers shall approve organized swimming activities. If organized swimming is approved, proceed as follows:

- 1. Ensure a risk assessment has been conducted to include a plan for water rescue and to respond immediately to accidents.
- 2. Designate a person qualified in water safety to supervise the activity.
 - a. Have a competent person inspect potential swimming areas for treacherous currents, deep holes, or other hazards. Keep swimming areas free of debris and rocks.
 - b. Do not permit anyone to enter the water alone. Equip the area with strategically placed life-saving equipment such as lines, reaching-poles, and ring-buoys.
 - c. Assign lifeguards whenever swimmers are in the water. Assign a lookout to observe all swimmers all the time. Use a buddy system.
 - d. Prohibit swimming after dark.
 - e. Monitor the weather.
 - f. Ensure that employees observe the following:
 - (1) Do not swim if overheated.
 - (2) Are able to recognize exhaustion symptoms and treat the problem.
 - (3) Know how to treat cramps, which swimming in cold water can cause.
 - (4) Never dive into water until the depth and water temperature have been checked. Check the location of others before diving.