

Guidelines for Weed-Free Seed, Forage, Mulch, and Fill Materials in Region 3

Policy provided in Forest Service Manual (FSM) 2900 – INVASIVE SPECIES MANAGEMENT requires that every effort should be made to ensure that all materials used on the National Forest System (NFS) are free of invasive species and/or noxious weeds (including reproductive/propagative material such as seeds, roots, stems, flowers, leaves, etc.). Actions taken under BAER (Burned Area Emergency Response) must comply with FSM 2081 [now FSM 2900], Executive Order 13112, and applicable State noxious weed prevention requirements in setting standards for seed, straw, and other plant materials (FSM 2523.2). Where States have legislative authority to certify materials as weed-free (or invasive-free) and have an active State program, forest officers are required to develop rules restricting the possession, use, and transport of those materials unless proof exists that they have been State-certified as weed-free (or invasive-free), as provided in 36 CFR 261 and Departmental Regulation 1512-1 (FSM 2903).

Requirements for inspection, testing, and certification of weed-free materials largely follow Government regulations for various weed species. A noxious weed is any plant (typically invasive) that is regulated by Federal, State, or county governments due to concerns with public health, agriculture, or property. Under a State's seed law, seed from prohibited noxious weeds cannot be sold, grown, or transported in that State. Restricted noxious weed species are highly restricted by a State in the number or percentage of seeds that can be found in any seed lot. Specifications for prohibited and restricted weed seed for all 50 States are summarized in USDA's *State Noxious-Weed Seed Requirements Recognized in the Administration of the Federal Seed Act* (<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=STELPRDC5090172>).

To ensure that invasive weed species are not introduced during projects involving NFS lands in Region 3, the following set of guidelines should be implemented for (1) seed testing for invasive weed seed and (2) inspection, testing, and/or certification of forage, mulch (straw or wood), and fill materials. Requirements and specifications in the Regional guidelines should be used in BAER contracts, rule or regulation setting, road construction and maintenance, office landscaping, seeding for range and watershed rehabilitation, and other Forest Service operations or processes. Applicable parts of this document may be adapted as necessary to specific sections of contracts, agreements, purchase orders, etc. The Regional guidelines may be modified on a case-by-case basis; however, any changes to requirements for inspection, testing, or certification must be discussed beforehand with forest invasive species coordinators. More information

on the use of weed-free materials may be found in the *Guidance for Invasive Species Management in the Southwestern Region* (http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3801891.pdf).

I. Seed Testing

Forest Service contracts and purchases should ensure that seed used on NFS lands is free of invasive weeds (FSM 2903). Individual forests may also have specific contracting or purchasing requirements to exclude seed of common weed species known to be harmful to NFS lands. Since seed of native plant species is often contaminated with seed of invasive or common weeds, practical limits on the level of contaminating weed seed as found during seed testing may have to be set in contracts and purchases in some situations. The limits set on amounts of invasive or common weed seed in a particular seed mix must be protective of land resources associated with NFS lands where the seed is to be applied.

Seed Quality

Performance – Tests for Pure Live Seed (PLS) and percentages of plant species present in the seed mixture should show compliance with contracted seed specifications. Seed tests should also indicate whether seed from noxious, prohibited, restricted, or forest-prohibited weed species is present.

Source of collected seeds – It is essential that seed used for project seeding is adaptable to destination States involved with Region 3 (AZ, NM, OK, or TX) where the seed will be applied. Therefore, preference may be given to seed collected in the western or southwestern parts of the US.

In situations where seed origin is of specific concern, AOSA has a classification for seed certification termed *Source Identified Seed* that allows verification of the origin and ecotype of specific native seed collections (along with seedlings or other propagative materials). Certification agencies can follow AOSA procedures for this classification to verify that seed is harvested in natural stands, seed production areas, fields, or orchards where no selection or testing of the parent population has been conducted. Bags containing *Source Identified Seed* receive a yellow seed tag to indicate that the location of the seed harvest has been reasonably verified by the certifying agency. Seed certified as *Source Identified Seed* may be requested at the time of purchase or through a task order when (1) verification of a seed source is needed, (2) a local seed source is required, or (3) an adequate source of seed exists locally. This specific seed class may be used in conjunction with direction given under FSM 2070 – VEGETATION ECOLOGY, which requires choosing native plant materials for revegetation, restoration, and rehabilitation of NFS lands whenever possible.

Weed-free specifications – Seed tests should show that a particular seed lot does not contain seed of noxious weed species in any appreciable amounts. In addition, seed lots should not contain seed in any appreciable amount of cheatgrass (*Bromus tectorum*), Japanese brome (*Br. japonicus*), Russian thistle (any *Salsola* species), or any weed species prohibited by a national forest unless specifically authorized by the COR (Contracting Officer’s Representative). For all other weed species, the combined total weight of seed from such species should not exceed 0.5% in a seed lot. In addition, the seed lot should contain no more than 2% by weight (total) of other types of non-weedy seed which includes seed from agronomic crops and native, non-weedy plant species other than those specified in the contracted seed mix.

Seed testing – Seed used for project seeding must be analyzed by an independent third-party seed lab that follows standards of the Association of Official Seed Analysts (AOSA). A number of seed labs (State-affiliated and private) in the Southwest perform seed testing according to AOSA standards. Further information on seed labs can be found at these websites:

1. AOSA contact list for seed labs (http://www.aosaseed.com/members_directory)
2. Colorado Seed Laboratory (http://seedlab.colostate.edu/testing_info.html)
3. New Mexico State Seed Laboratory (<http://www.nmda.nmsu.edu/seed-lab/>)

Representative seed samples of individual seed lots used for seed testing should be pulled after the purchase order or task order is received for a seeding project. If Forest Service personnel are unavailable to pull samples, Contractors must use an independent third-party contractor who is responsible for pulling seed samples from seed lots and then sending the samples to the seed lab in accordance with standard chain-of-custody procedures. In general, seed lots should be tested after a specified seed mix has been blended. However, pre-mix testing by a Contractor may specifically be authorized by the COR or a particular contract if there is a time-sensitive requirement such as in BAER actions. At least two weeks should be allowed for seed testing although this can vary according to season. The Purchasing Agent or Contractor should consult the seed lab beforehand on time required for analyses as well as sample quantities and procedures necessary for testing. Costs of seed mixing, sampling, testing, and shipment should ordinarily be paid for by the Contractor and be part of the bid price for a contract.

Samples taken from seed bags, totes, or bulk lots must be representative of seed variability. For seed lots consisting of 1 to 5 bags (or tote containers in some cases), each bag should be sampled by using a probe or by thrusting a hand into the seed. For lots consisting of 6 or more bags, 5 bags should be selected at random across the lot and sampled including at least 10% of the total number of bags in the lot. As an example, 6 bags out of a 10-bag lot should be randomly selected and tested (6 bags = 5 bags + (0.1 x 10

bags)). However, no more than 30 randomly selected bags or totes should be sampled from the lot regardless of the total number of bags or totes. Individual samples of equal size taken from the bags or totes should be (1) thoroughly mixed and pooled into a composite sample, (2) divided down to the amount required by the seed lab, and (3) put into a single, securely sealed container (zip-lock bag, cloth bag, heavy-stock envelope, etc.) for shipment to the seed lab.

For bulk lots of loose seed in a bin or truck bed, samples of the same size should be taken across evenly distributed portions of the bulk lot. A long probe or trier that can reach all depths of seed should be used to sample randomly within each same-sized portion of the bulk lot. If a probe or trier is unavailable or impractical, the samples should be taken manually by thrusting a hand into the seed. To derive the number of samples to be taken, the gross amount of seed in the lot should be divided by the average wt. of a seed bag, which typically is 50 lbs. (e.g., 1,000 lbs. seed ÷ 50 lbs. seed = 20 seed samples). However, no more than 30 cores or handfuls should be taken from the bulk lot regardless of the total amount of seed. Individual samples of equal size taken as cores or handfuls should be (1) thoroughly mixed into a composite sample, (2) divided down to the amount required by the seed lab, and (3) put into a single, securely sealed container (zip-lock bag, cloth bag, heavy-stock envelope, etc.) for shipment to the lab.

Samples sent to the seed lab must be tested under AOSA standards to determine purity, germination, moisture, inert materials, non-contractual types of crop seed, and weed seed. Seed germination rates may be determined by either germination tests or by testing with tetrazolium (TZ). TZ testing requires less time than germination tests which can take days to weeks. However, germination tests may be required for adequate testing of seed from certain plant species whose seed is unsuited to TZ testing.

Also, seed sent to a seed lab must be analyzed according to (1) noxious weed lists of the States of origin and destination and (2) noxious weed listings for all 50 States found in USDA's *State Noxious – Weed Seed Requirements Recognized in the Administration of the Federal Seed Act*. The seed should also be analyzed for cheatgrass, Japanese brome, Russian thistle, or any other weed species prohibited by the forest where the seed is to be applied.¹ The Contractor or COR must inform the seed lab of all States whose noxious weed lists should be considered during seed analyses.

Cleaning – All seed should be cleaned so that no stems or debris longer than ¾ inch remain. Seed should also be visually inspected on a random basis for impurities.

Storage – Contracted seed must be stored securely after samples are pulled.

¹ Russian thistle was established during a seeding project on the Kaibab NF due to inadequate testing by a seed lab.

Acceptance – Test results for individual seed lots must be valid for date of seed application. For contracts, the origin of seed lots and seed lab test results must be reported to the COR prior to project implementation. At its discretion and own expense, the Forest Service may test seed lots before using the seed in project seeding. The Forest Service reserves the right to reject seed mixes by lot number that:

1. Do not meet contractual requirements for seed mix percentages, PLS, or *Source Identified Seed*.
2. Are not free of noxious or prohibited weed seed in any appreciable amounts.
3. Have restricted weed seed content greater than allowed by State standards.
4. Contain any seed from cheatgrass, Japanese brome, Russian thistle, or any forest-prohibited weed species unless specifically authorized by the COR.
5. Exceed contents stated above for other types of weed seed or crop seed.
6. Are improperly cleaned.

If a suitable source of seed cannot be found to meet a particular time frame or limitations on cost, the Forest Service may alter seed requirements in the task order (except test requirements for invasive or common weeds) or cancel the order.

Purchase Orders or Contractor-Furnished Items and Services

The following should be included as part of (1) a seed purchase order or (2) the items listed in a contract for meeting special equipment, ground support, and documentation needs:

1. All bags used for seed or seed stored in bulk lots should meet appropriate State seed law labeling requirements and have the following information listed on tags or transportation paperwork as appropriate:
 - a) Name and variety of each seed component in excess of five percent of the whole; hybrids should be labeled as such when present.
 - b) Lot number or other lot identification.
 - c) Origin (State or County, if known) – This includes information on yellow certification tags used for the *Source Identified Seed* class when requested by a task order. If origin is unknown, that fact should be stated.
 - d) Net weight – Percentage by weight of all Pure Live Seed (PLS).

- e) Percentage by weight of inert matter.
- f) Percentage by weight of all other crop seeds.
- g) The name and rate of occurrence per pound of weed seed present.
- h) The name and rate of occurrence per pound of each kind of noxious weed seed present.
- i) Test results for percent germination or tetrazolium for each seed species.
- j) The calendar month and year the test was completed.
- k) Name and address of the company or person responsible for analysis of seed.
- l) Name and address of the company selling the seed.

In addition to the information listed above, the COR may also request supplementary information to be placed on the label such as project name, national forest, unit, etc.

Required Documentation from Contractors

In addition to daily operational reports and a final report, a contract should also require:

1. Written documentation of the total amount (in pounds) of seed delivered.
2. Seed tags or transportation paperwork from each lot of seed delivered (including any yellow *Source Identified Seed* tags) that must be attached to a separate sheet.
3. Seed lab test results.

II. Certification, Inspection, and Testing for Forage, Mulch (Straw or Wood), and Fill Materials

Products that can be certified through weed-free programs include forages, mulches, and materials used for erosion control or fill. Products certified through these programs normally must meet minimum standards provided by the North American Invasive Species Management Association (NAISMA). To obtain certification, the product must be inspected prior to harvesting or distribution by a trained inspector from a certifying State agency (or a professional organization in some cases).

States involved with Region 3 vary considerably in weed-free programs for inspecting and certifying weed-free materials. Arizona and New Mexico will inspect and certify forage and straw mulch. Currently, Oklahoma and Texas do not have weed-free certification programs; however, producers in the Texas panhandle may request inspection by a New Mexico program inspector to certify weed-free fields. In addition, New Mexico will inspect gravel/borrow material whereas Arizona's program does not. Further information on certification programs for weed-free materials can be found at:

1. Arizona Crop Improvement Association (ACIA) (<http://www.arizonacrop.org/index.html>)
2. New Mexico State University (<http://seedcertification.nmsu.edu/certified-weed-free-fora.html>)
3. Colorado Dept. of Agric. (<https://www.colorado.gov/pacific/agconservation/weedfreeforage>)

Certification of Agricultural Fields

Certification of weed-free forage or straw mulch is accomplished when an inspector from a certifying agency inspects a field prior to harvest and issues a "Certificate of Inspection" to indicate that feed forage or straw from the field is free of noxious weeds (see Exhibit 1 below). Certification does not guarantee a complete absence of noxious weeds; it only certifies that the inspector has made a reasonable and prudent visual inspection of the field. In some cases, forage or straw may be designated as meeting a minimum requirement for being "weed free" when only immature noxious or prohibited weeds are present.

However, no field with viable seed or other propagative parts from noxious weeds can be certified.

Bales from inspected fields are identified with purple/yellow twine (or orange/blue), galvanized wire, or certification tags (Exhibit 2). The special twine, wire, and/or tags (also called labels) provided to the producer at the time of inspection are used for proof of certification. When twine or wire is used, at least one strand needs to be wrapped around each bale of certified hay/straw.

Exhibit 1: Certificate of inspection issued in New Mexico

No. _____



New Mexico State University Seed Certification
 Agricultural Experiment Station
 College of Agricultural, Consumer and Environmental Sciences
 New Mexico State University
 MSC 3Ley PO Box 30003
 Las Cruces, NM 88003-8003
 Phone: (575) 646-4125 Fax: (575) 646-8137



CERTIFICATE OF INSPECTION
New Mexico Noxious Weed Certification Program

This certifies that the field(s), quarry, facility or site as described herein, have been inspected according to North American Forage Certification Standards using both the North American and the New Mexico Department of Agriculture (NMDA) list of noxious species. The objective of this program is to help prevent and slow the spread of designated noxious weeds by providing products which are free* of the potential for transport and dispersal of listed weed species.

Producer: _____ Phone: (____) _____

Address: _____

City: _____ State: _____ Zip Code: _____

Field(s), Quarry, Facility or Site Description:

Acres Inspected: _____ Cutting: (circle one) 1st 2nd 3rd Other _____

Tons/Bales: _____ Other Type: _____

Commodity

A. _____ **MEETS** requirements of the North American Forage Certification Standards using both the North American and the NMDA list of noxious species. This commodity contains variable amounts of annual weeds and/or other weeds not listed as prohibited or noxious.

B. _____ **COMPLIES with MINIMUM REQUIREMENTS** of the North American Forage Certification Standards using both the North American and the NMDA list of noxious species. This commodity contains variable amounts of prohibited or noxious weed species which were immature, (no viable seed) when harvested/produced, or were treated to prevent seed formation. These plant parts, although not usually desirable in the commodity, are not considered able to begin new infestations.

Weeds Noted:

Additional Comments:

REQUIREMENTS

Forage must be certifiable within 10 days of harvesting; and inspected in the Field of Origin by proper officials. Inspection shall include surrounding ditches, fence rows, easements, roads, loading areas and stockyards.

Certified by: _____ Title: _____

*Certification does not guarantee the absence of seeds listed as prohibited or noxious; certification is based upon prudent and reasonable visual inspection. This certificate is Not Transferable. End User must have the original white Transit Certificate (no photo copies), or commodity must be identified with an approved marking system such as special twines or tags. For additional information call the New Mexico State University Seed Certification at (575) 646-4125

White copy – Producer; Yellow copy – NMSUSC; Pink copy – Inspector

From: NMSU's Noxious Weed Free Certification Program website (<http://seedcertification.nmsu.edu/certified-weed-free-fora.html>).

Exhibit 2: Purple/yellow twine and tag (label) used in New Mexico for certification



From: NMSU's *Noxious Weed Free Certification Program* website (<http://seedcertification.nmsu.edu/certified-weed-free-fora.html>).

A "Certificate of Transit" is issued by a certifying agency to verify that bales from a particular stack or lot originated from inspected fields (Exhibit 3). Transit certificates offered by certifying agencies for shipment of certified products are filled out by the inspector at the time of inspection with the exception of specific information on (1) the shipper and (2) the end user or consignee. The certificates are ordinarily issued for interstate shipping; however, they may also be issued for shipping within a State.

A. Forage

To help prevent introduction of invasive weeds, weed-free forage for pack-and-saddle animals should be used on NFS lands and particularly in wilderness areas. The term "forage" is used broadly by weed-free certification programs to include alfalfa, grass hay, straw, cubes, feed grains, and other crop-related products. In accordance with FSM 2903, Forest Service contracts and purchases should ensure that animal forage or straw bedding is free of invasive species and/or noxious weed before use on NFS lands. Also, the *D-10 Noxious Weed and Exotic Plant Prevention and Control* clause from FSH 2709.11 Chapter 52.4 should be included in special use authorizations such as those for permit holders.

Exhibit 3: Transit certificate issued in New Mexico



New Mexico State University Seed Certification
 Agricultural Experiment Station
 College of Agricultural, Consumer and Environmental Sciences
 New Mexico State University
 MSC 3Ley PO Box 30003
 Las Cruces, NM 88003-8003
 Phone: (575) 646-4125 Fax: (575) 646-8137



TRANSIT CERTIFICATE
New Mexico Noxious Weed Certification Program

Certificate Issuance Date: ____/____/____ Certificate Shall Terminate On: ____/____/____

Commodity is in Transit to (specify): _____

Transporter: _____ Vehicle Lic. _____

Marking type (circle one): tag or twine Phone: (____) _____

Address: _____ City: _____ State: _____ Zip: _____

End User or Consignee: _____ Phone: (____) _____

Address: _____ City: _____ State: _____ Zip: _____

Enforcing Agency: _____ Initials: _____ Date: ____/____/____

Forage in transit has been inspected according to North American Forage Certification Standards. An approved marking system such as special twine or tags may be used in place of this form.

NMSUSC Inspection Certificate # _____ Date: _____

Producer: _____ Commodity Type: _____

Cutting (circle one): 1st 2nd 3rd Other _____

Tons/Bales _____ Other Type _____

A. ____ **MEETS** requirements of the North American Forage Certification Standards using both the North American and the NMDA list of noxious species. This commodity contains variable amounts of annual weeds and/or other weeds **not listed** as prohibited or noxious.

B. ____ **COMPLIES with MINIMUM REQUIREMENTS** of the North American Forage Certification Standards using both the North American and the NMDA list of noxious species. This commodity contains variable amounts of prohibited or noxious weed species which were **immature**, (no viable seed) when harvested/produced, or were **treated** to prevent seed formation. These plant parts, although not usually desirable in the commodity, are not considered able to begin new infestations.

Weeds noted: _____

Additional comments: _____

Issued by: _____ Title: _____

***White copy shall be delivered to the End User or Consignee upon final delivery. Using this certificate to represent a commodity other than the lot specified shall constitute a violation of New Mexico Weed Free Forage Certification Standards. Photo copy of Transit Certificate will not be accepted. End User shall only accept the original white copy. For additional information call the New Mexico State University Seed Certification at (575) 646-4125.**

White copy - End user or Consignee; Yellow copy - NMSUSC; Pink copy - Inspector

From: NMSU's Noxious Weed Free Certification Program website (<http://seedcertification.nmsu.edu/certified-weed-free-fora.html>).

Although Region 3 does not currently have a weed-free order for animal forage, private owners and users of pack-and-saddle animals should be encouraged to use forage certified to be weed-free or else a commercially processed feed.² Commercially processed feed includes pellets or steamed, rolled grains. Pellets are agglomerated animal feed that has been formed by mechanically compacting and forcing the feed through die openings in conjunction with steam. Commercially processed feed is considered to be weed free when heated to at least 140 °F; consequently, it does not need to be State certified. However, hay cubes are generally too large to ensure that all weed seed in a cube is treated by heat. Therefore, field certification or testing for noxious and other weed seed should normally be required for hay cubes.

General Requirements

Performance – Forest Service contracts or agency funded operations to obtain forage for pack-and-saddle animals should be either (1) forage certified to be weed-free or (2) commercially processed feed. The forage should also be free of inert materials and pest species such as fire ants. In lieu of State certified weed-free forage, commercially processed feed should be used by pack-and-saddle animal on NFS lands.

Weed-free specifications – Contracted feed forage (hay, hay cubes, or grass) should be certified under certification standards of the Weed Free Forage Program of the North American Invasive Species Management Association (NAISMA) (<http://www.naisma.org/weed-free-forage>).

Certification – To signify certification, individual bales of hay or grass must be appropriately identified with purple/yellow twine, galvanized wire, or certification tags (labels) from a certifying agency. Bales without one of these markings should be rejected. Bags of hay cubes should also be appropriately marked as being certified. For large shipments of forage, a certificate of transit or inspection may be requested by the Forest Service. An original or copy of the transit certificate should also accompany all inspected forage that has crossed a State line during shipment. As an alternative, copies of the inspection certificate obtained from the forage producer or certifying agency may be used in some cases rather than the transit certificate. This situation may arise particularly with some intrastate shipments of forage.

Acceptance – For agency-funded or contracted operations of the Forest Service, either commercially processed pellets or forage certified to be weed free must be used. Evidence of certification such as colored twine, galvanized wire, or tags must be presented to the Purchasing Agent and/or COR prior to storage or use of forage bales or hay cubes on NFS lands. The Forest Service may also request

² Leafy spurge (*Euphorbia esula*) is a noxious weed that may have been established on the Coconino NF through contaminated forage hay or straw bedding used for pack-and-saddle animals.

certificates of transit or inspection as appropriate. At its discretion and own expense, the Forest Service may test contracted forage for weed seed before use. Forage that is not certified, found to be free of noxious and other weeds in any appreciable amounts, or does not meet contractual forage quality should be rejected.

B. Straw Mulch

Straw mulch is commonly used in post-fire rehabilitation to provide ground cover. However, mulch spread over burned landscapes has considerable potential to introduce seed or propagative parts from invasive plants or other potentially harmful weeds.³ Prior to applying mulch over a burned landscape, a Forest Service invasive species coordinator should be consulted as to whether mulching in the burned area has the potential to establish or increase invasive weeds or other types of harmful weeds.

Under FSM 2903, straw mulch used on NFS lands must be free of noxious weeds. Individual forests may also specifically prohibit common weed species that could be harmful to NFS lands if the mulch is applied. Certification, inspection, and/or testing are normally used to assure that straw mulch is reasonably free of invasive or common weeds. Since agricultural grain fields used for straw are often infested with invasive or common weeds, practical limits on the amount of seed and reproductive plant parts of these weed species as found during inspection or testing may have to be set in contracts and purchases in some situations. However, limits on seed and reproductive plant parts of invasive or common weeds set for straw mulch must be protective of land resources where the mulch is to be applied.

Forest Service contracts and purchases for straw mulch should ensure that requirements for certification, inspection, or testing of invasive weeds are met (FSM 2903). Contractors should also be required to prevent accidental spread of invasive weeds carried by vehicles, equipment, personnel, or materials used in the performance of the contract.

Straw Mulch Quality

Performance – Straw used for mulch should be free of noxious weeds and weeds specifically prohibited by national forests. It should also be free of inert materials and pest species such as fire ants.

Weed-free specifications – Baled straw should be certified to be free of noxious weeds through a certification program that follows standards of the North American Invasive Species Management

³ After the Wallow fire on the Apache-Sitgreaves NFs in 2011, musk thistle (*Carduus nutans*) increased significantly in mulched areas with moderate to high burn severity suggesting that musk thistle seed was either present in the aerially applied straw mulch or that the mulch possibly may have provided cover for unburnt thistle seed to germinate thereby causing proliferation of this noxious weed in those areas.

Association (NAISMA) (<http://www.naisma.org/weed-free-forage>). The straw must be completely free (or at least be free of viable seed or reproductive parts) of weed species that have been listed in noxious weed lists of the States of origin and destination for the straw as well as weeds listed in the North American Noxious Weed List, which is part of NAISMA's North American Weed Free Forage Certification Standards. To signify certification, individual bales of straw mulch should be appropriately identified with colored twine, galvanized wire, or certification tags (labels) from a certifying agency.

In addition to noxious weeds, straw must also be free of harmful weeds that may not be listed on State noxious weed lists but could potentially be established when the straw mulch is applied on NFS lands. This includes weedy species prohibited for introduction or spread as identified by the COR, forest plans, NEPA decisions, or weed management plans of the national forest or national grassland where mulch application is to occur. At a minimum, mulch should not have seed or plant parts in appreciable amounts of cheatgrass, Japanese brome, Russian thistle, or forest-prohibited weed species unless authorized by the COR. The Forest Service reserves the right to reject bales or lots containing these weed species or other harmful weed species. Specified limits on forest-prohibited weed species should be provided to the Contractor prior to Contractor acceptance of the terms of an individual project.

Certification of straw – The Contractor and/or Forest Service should inspect bales to confirm certification before shipment. To signify certification, individual bales must be identified under a marking system that uses colored twine, galvanized wire, or certification tags (labels). Bales without one of these markings should be rejected. A transit certificate used for interstate shipment should accompany all certified straw mulch that has been shipped across State lines. For each truckload of straw mulch material shipped across a State line, the Contractor must submit an original or a copy of the transit certificate to verify that straw bales shipped from a particular stack or lot originated from inspected fields. The certificate should be fully completed to include (1) contact information for the straw producer and the inspector(s), (2) the inspection certificate number, and (3) the estimated quantity of straw inspected in number of bales or tonnage. In cases where a transit certificate is unavailable (as possibly occurs with intrastate shipments), the Contractor must either obtain a transit certificate from the certifying agency or else copies of the inspection certificate(s) from the straw producer or certifying agency. Bales with markings (colored twine, galvanized wire, or tags) that do not correspond with an applicable transit or inspection certificate should be rejected.

Inspection/testing of uncertified straw – In situations where a sufficient supply of certified straw is unavailable for mulch, uncertified straw may be used after inspection and testing for noxious or other types of weeds. Inspection and testing of uncertified straw is particularly necessary due to the possible

presence of jointed goatgrass (*Aegilops cylindrica*), wild oat (*Avena fatua*), brome grasses, Russian thistle, or other weeds commonly found in grain-producing fields.⁴ Inspections and testing of bales (typically large round or rectangular, approx. 4-6 ft. in width) should be arranged by the Contractor and/or Forest Service prior to loading and shipment. For testing, ten bales out of every 30 bales in a stack or lot should be randomly selected for sampling prior to loading and shipping (i.e., 10 bales ÷ 30 bales = 0.33 or 33% tested). For stacks or lots with fewer than 30 bales, the sampling percentage should still be 33% of the total number of bales. A coring instrument or hay knife should be used to obtain subsurface samples of equal size by coring or thrusting into the bale. When Forest Service personnel are unavailable to pull samples, Contractors must use an independent third-party contractor who is responsible for pulling straw samples from bales and then sending the samples to the seed lab in accordance with standard chain-of-custody procedures. Individual subsurface samples obtained from each of the 10 bales selected out of a 30-bale stack or lot (or smaller stacks or lots when fewer than 30 bales are present) should be (1) thoroughly mixed in a 5-gal bucket into a composite sample, (2) divided down to an amount (usually 2 lb.) required by the seed lab for testing, and (3) put into a securely sealed container (paper bag, cloth bag, etc.) for shipment to the seed lab.

The Contractor or Purchasing Agent should consult an AOSA seed lab capable of testing bulky samples on appropriate procedures necessary for testing of samples and the time required for analysis. This should be determined beforehand since not all seed labs may be capable of processing and testing bulky samples such as straw. Uncertified straw samples sent to a seed lab must be tested for presence of weeds according to (1) noxious weed lists of the States of origin and destination and (2) noxious weed listings for all 50 States found in USDA's *State Noxious – Weed Seed Requirements Recognized in the Administration of the Federal Seed Act*. The Contractor must inform the seed lab of all States whose noxious weed lists should be considered during the analyses. The straw should also be tested for cheatgrass, Japanese brome, Russian thistle, or any other common or invasive weed species that is not on a particular noxious weed list but may be prohibited by the forest. Straw testing should generally be the responsibility of the Contractor unless the Forest Service, at its discretion, assumes this responsibility.

Prior to final purchase of uncertified straw, the purchase must be approved by the Forest Service. No agricultural straw material will be accepted until test results have been accounted for by the Forest Service. All straw mulch will be rejected from any 30-bale stack or lot (or smaller stacks or lots when fewer than 30 bales are present) if the respective sample tests positive in any appreciable amount for seed

⁴ Jointed goatgrass is a noxious annual grass found in wheat fields. The species resembles wheat and can actually hybridize with wheat as it is genetically related. Jointed goatgrass was most likely established on several national forests in Region 3 through contaminated straw mulch or straw bedding used for pack-and-saddle animals.

or plant parts from noxious or forest-prohibited weed species. In addition, Forest Service personnel should conduct an inspection of each incoming truckload for presence of these weeds in bales and reject any truckload with such weeds unless otherwise authorized by the COR. The Forest Service reserves the right to conduct testing of straw mulch for seed from noxious, prohibited, restricted, or forest-prohibited weed species prior to application.

Storage – Straw bales should be stacked in storage areas on dry ground clear of noxious and other weeds or else placed on canvas tarps or plastic sheets.

Acceptance – For certified straw, individual bales on each truckload must be appropriately marked by colored twine, galvanized wire, or certification tags (labels) to signify certification. Requisite originals or copies of the transit or inspection certificate must be presented to the COR or Project Manager for each truckload. To accept uncertified straw, results of any lab testing conducted to determine whether straw mulch is weed free must be reported by the Contractor for each 30-bale stack or lot (or smaller stacks or lots when fewer than 30 bales are present). The Forest Service reserves the right to reject mulch that:

1. Does not meet contractual mulch quality.
2. Is not certified or tested to be free of noxious or prohibited weeds in any appreciable amounts.
3. Contains seed or plant parts from cheatgrass, Japanese brome, Russian thistle, or other weed species specifically prohibited in a task order.

If a suitable source of mulch material cannot be found to meet a particular time frame or limitations on cost, the Forest Service may alter mulch requirements (except inspection or testing requirements for noxious weed or weeds prohibited in a task order) or cancel the order.

Staging Areas for Straw Mulch

The Contractor should be responsible for identifying potential weed-free staging areas and gaining access to staging areas located within Federal, State, or local public lands. The COR should approve all potential staging areas prior to mobilization. Staging areas should ordinarily not be located on private property. Should reasonable staging areas on public lands not be an option, the Contractor should discuss the issue with the COR for guidance on possible options for staging on private lands.

In addition to delivering straw bales to staging areas, the Contractor should be responsible for unloading bales and neatly stacking them in preparation for loading the bales into nets for distribution. Certified bales should be stacked in a manner that allows colored twine, wire, or tags to be visible on each

individual bale. Uncertified bales should also be stacked in a manner that allows visual inspection and testing for weedy vegetation. Bales should be stacked on dry ground clear of weeds or else placed on tarps/plastic.

The Contractor should perform daily clean-up of staging areas and take precautions such as fencing to limit spread of mulch material. Contractor should also be responsible for clean-up and rehabilitation of staging areas to original pre-use conditions. This includes removal of any earthwork developed for staging area operations and any damage to roads, trails, gates, or fences used to access the staging area. Rehabilitation tasks may include scarification of ground surfaces, application of tested seed, or repairing damage to trees. All rehabilitation methods and materials (including seed) should be approved by the Forest Service.

Contractor-Furnished Items and Services

The following items should be included in a contract as part of the special equipment, ground support, and documentation needs:

1. Seed lab testing results must be presented to the Forest Service prior to shipment of straw. Original documents or unaltered copies from all applicable certifying agencies should be retained by the Contractor for all straw mulch and presented to the Forest Service during inspections and at the time of arrival of straw at staging areas. In addition to providing the documentation, the Contractor will provide the location(s) for the stacks or lots where mulch material is currently stored. Forest Service personnel may go to the storage sites as necessary to verify that twine, wire, or bale tag numbers are matched to associated transit or inspection certificates and to collect samples for testing when required. Straw (particularly uncertified straw) may also be inspected and tested by the Forest Service for presence of noxious weeds or forest-prohibited weeds.
2. For each truckload of mulch that has crossed a State line, the Contractor must submit an original or copy of the transit certificate issued by the appropriate certification agency for end users or consignees. When a transit certificate is unavailable, a copy of the inspection certificate(s) for all inspected fields must be submitted. The certificates must be in effect during the shipping process for the straw and should be fully completed to include (1) contact information for the straw producer and the inspector(s), (2) the inspection certificate number, and (3) the estimated quantity of straw inspected in number of bales or tonnage. Bales marked by colored twine, galvanized wire, or bale tags must correspond with any issued transit or inspection certificate.

3. During operations at staging areas, the Contractor should retain any colored twine, galvanized wire, or bale tags from all used-up straw bales and present these items to the COR to verify proper utilization of bales.
4. Contractor should provide receptacles to ensure proper disposal of waste.
5. Contractor should have a plan outlining what precautions and mitigation will be in place to limit spread of material and dust prior to project initiation. This should include daily clean-up plans, mitigation strategies, and equipment that will be used to meet the specifications.
6. Contractor is responsible for the cleaning of all vehicles and equipment to ensure that they are free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious or other weed seed and reproductive plant parts prior to entering Forest Service lands or private lands. Contractor must provide written certification of compliance with terms for cleaning vehicles and equipment prior to moving onto job site.

Required Documentation from Contractors

In addition to daily operational reports and a final report, required documents for a contract should include:

1. Certified truck weights – Certified truck weights showing tare and loaded weights for each truckload should be presented to the COR.
2. Transit certificate – For each truckload of straw delivered during a project, the Contractor must submit an original or copy of any transit certificate issued by a certifying agency to the COR.
3. Inspection certificate(s) – When a transit certificate is unavailable, copies of certificates for field inspections that have been conducted on all fields providing straw for the mulch project must be presented to the COR for each truckload of straw delivered during a project.
4. Seed lab test results for each 30 bales in a stack or lot (or smaller stacks or lots when fewer than 30 bales are present) of uncertified straw delivered.
5. Written certification of compliance with terms for cleaning vehicles and equipment prior to moving onto a job site.

C. Wood Mulch

Wood mulch used for soil erosion control after a fire varies in size to allow interlocking that will resist water runoff and wind removal. The size of wood shred for the mulch consists of a relatively even composition of both smaller and larger lengths strands. The interlocking caused by differences in shred size allows wood bark mulch to be used on steeper slopes than straw mulch.

Certification programs or testing protocols ensuring that wood mulch is free of noxious weeds are not currently available. Therefore, an inspection should be conducted in wooded areas used as the source of wood mulch. In accordance with FSM 2903, Forest Service contracts and purchases for wood mulch should require that an inspection be conducted in wooded areas prior to when the wood mulch is obtained. The *D-10 Noxious Weed and Exotic Plant Prevention and Control* clause from FSH 2709.11 Chapter 52.4 should be included in special use authorizations for wood mulch. Contractors should also be required to prevent accidental spread of invasive weeds carried by vehicles, equipment, personnel, or materials used in the performance of a contract.

General Requirements

Performance – Suitable wood for mulch may be obtained locally or transported from other areas. Wood mulch obtained outside of the area of application should be free of invasive weeds. The mulch should also be free of inert materials and pest species such as fire ants.

Source of wood mulch – It is desirable that wood mulch used for rehabilitation is appropriate for project sites on NFS lands. Therefore, preference should be given to weed-free wood mulch collected locally or at least in the same ecophysiological region as the intended site of application.

Inspection methods – Determination of weed-free status of source areas for wood mulch will be based on a reasonable and prudent visual inspection. If the area of application for wood mulch is the same as its source area, an inspection of the source area is not required since invasive weeds, if present in the wood mulch, would not contribute measurably to existing infestations. When wood mulch is obtained from outside the area of application, the source area should be inspected including any ditches, fence rows, roads, easements, rights-of-way, or buffer zones surrounding the source area. The source area must be free of weeds listed in noxious weed lists of the States of origin and destination. The onsite inspection must be conducted by either the Contractor or Forest Service personnel; therefore, one of the following options for inspection should be chosen for the project:

Option 1 – The Contractor is responsible for onsite inspection of mulch materials for invasive weeds according to a specific weed list provided by the Forest Service and/or the State's noxious weed list.

Contractor-provided expertise and methods to establish weed-free status must be appropriate for weeds of concern in the local area.

Option 2 – The Forest Service is responsible for approval of wood mulch sources based on inspection of proposed sources by a Forest Service invasive species coordinator or other qualified specialist (botanist, range specialist, etc.).

Storage – Storage of wood mulch on NFS lands should be limited to sites that are not infested by noxious or other weeds.

Acceptance – For projects involving a contract, the COR should request written documentation of (1) the Contractor’s expertise in assessing source areas for mulch and (2) methods used to determine the weed-free status of any and all materials furnished by a Contractor. Written approval of the specific source should be provided to the Contractor. The Forest Service reserves the right to reject wood mulch from a source area that has not been inspected or otherwise not proven to be free of seed or reproductive plant parts from noxious weeds. If these weed species are present in the proposed source area, appropriate mitigation measures may allow conditional use of the source as required by the COR.

Contractor-Furnished Items and Services

The following item should be included in a contract as part of the special equipment, ground support, and documentation needs:

1. The Contractor is responsible for cleaning of all vehicles and equipment to ensure that they are free of soil, seeds, vegetative matter, or other debris that could contain or hold non-native noxious weed seed or reproductive plant parts prior to entering Forest Service lands or private lands. Contractor must provide written certification of compliance with terms for cleaning vehicles and equipment prior to moving onto job site.

Required Documentation from Contractors

In addition to daily operational reports and a final report, required documents for a contract should include:

1. Written notification to the COR of proposed material sources ___ days prior to use.
2. Written documentation of Contractor expertise and methods used to determine the weed-free status of any and all materials furnished by a Contractor.

3. Written certification of compliance with terms for cleaning vehicles and equipment prior to moving onto job site.

D. Fill Materials

Under FSM 2903, all fill materials used on NFS lands such as sand, rock, gravel, or topsoil should be free of invasive weeds including reproductive/propagative material such as seeds, roots, stems, flowers, and leaves. Fill material includes any gravel/borrow materials (including cinders) used for construction or road surfacing and any topsoil used for rehabilitation or landscaping purposes. At a minimum, Forest Service contracts and purchases for fill materials should require that an inspection be conducted around sites serving as a source of fill prior to when the fill material is obtained or applied. As an option, gravel/borrow materials in New Mexico may be certified under the State's weed-free gravel program. The *D-10 Noxious Weed and Exotic Plant Prevention and Control* clause from FSH 2709.11 Chapter 52.4 should be included in special use authorizations for fill materials. Contractors should also be required to prevent accidental spread of invasive weeds carried by vehicles, equipment, personnel, or materials used in the performance of a contract involving fill materials.

General Requirements

Performance – Fill material used on projects involving NFS lands should not have seed or reproductive plant parts of noxious or invasive weed species in any appreciable amounts that will allow these weeds to become established wherever the fill is placed either temporarily or permanently.⁵

Source of topsoil – Topsoil used for rehabilitation or landscaping projects should be appropriate for project sites on NFS lands. Therefore, preference should be given to weed-free topsoil collected locally or at least in the same ecophysiological region as the intended site of application.

Weed-free specifications – All fill material (gravel, sand, borrow, aggregate, topsoil, etc.) transported onto NFS land or incorporated into project work must be free of noxious weeds in compliance with the Forest Service's supplemental section 105.02(a) to USDOT's *Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects* (FP-03, Metric Units), which can be found at <http://fsweb.r3.fs.fed.us/eng/transportation/development/preconstruction.html>.

⁵ As examples of potential weed contaminants in fill materials, infestations of noxious buffelgrass (*Pennisetum ciliare*), musk thistle, Scotch thistle (*Onopordum acanthium*), camelthorn (*Alhagi pesudalhagi*), and a number of knapweed species were established at several project sites on the Coconino and Coronado NFs because of contaminated fill materials. Seed from noxious African rue (*Peganum harmala*) was a contaminant in topsoil used to landscape a District ranger station on the Lincoln NF. In addition, blading (i.e., cutting and filling) during road maintenance has spread musk thistle and camelthorn along roadsides on the Coconino NF.

Inspection/certification – Fill material used in projects on NFS lands should be inspected for presence of invasive plants according to inspection standards of the Weed Free Gravel Program of the North American Invasive Species Management Association (NAISMA) (<http://www.naisma.org/weed-free-gravel>). An onsite inspection must be conducted at the site of origin for the fill material by the Contractor, Forest Service personnel, or an inspector from a certifying agency. Therefore, one of the following options for inspection should be chosen for the project:

Option 1 – The Contractor is responsible for onsite inspection of fill materials for invasive weeds according to the State’s noxious weed list and/or a specific weed list provided by the Forest Service. Contractor-provided expertise and methods to establish weed-free status must be appropriate for weeds of concern in the local area. A Forest Service invasive species coordinator should provide appropriate weed lists and methods to establish “weed-free” conditions applicable to the project.

Option 2 – The Forest Service is responsible for approval of fill material sources based on inspection of proposed sources by a Forest Service invasive species coordinator or other qualified specialist (botanist, range specialist, etc.) to determine weed-free status.

Option 3 – In New Mexico, gravel/borrow materials may be certified under the weed-free gravel program conducted by New Mexico State University (<http://aces.nmsu.edu/ces/seedcert/certified-weed-free-fora.html>). An official from this program will issue an inspection certificate to document that weed-free requirements for gravel or borrow material have been met based upon a reasonable and prudent visual inspection. Site inspections for gravel pits are required annually or periodically for certification.

Inspection methods – Areas to be used for supplying fill material must be free of noxious weeds including weed species listed in NAISMA’s North American Weed Free Forage Certification Standards List (http://www.naisma.org/images/Gravelpit_inspect_stdrs.pdf) and those weeds declared noxious within the States of origin and destination. In addition to inspection of the site where fill is stored, inspections should include, but not be limited to, any ditches, topsoil piles, gravel/sand piles, fence rows, roads, easements, rights-of-way, working areas, storage areas, or buffer zones surrounding the area. The fill material must be inspected prior to movement with sufficient time allowed to ensure that a weed seed bank or still viable reproductive plant parts are not present in the materials.

Storage – Storage of fill material on NFS lands must be limited to sites that are not infested by noxious weeds and other weeds as specified in a task order. Fill material stockpiles should be periodically inspected for invasive weeds and treated for these weeds as necessary.

Acceptance – For projects involving a contract, the COR should request written documentation of methods used to determine the weed-free status of any and all materials furnished by a Contractor. Written approval of the specific source should be provided to the Contractor. The Forest Service reserves the right to reject fill material that has not been inspected or otherwise not proven or certified to be free of seed or reproductive plant parts of invasive weeds. If weed species are present in the proposed source, appropriate mitigation measures may allow conditional use of the source as required by the COR such as implementing a requirement for weed treatment after the fill has reached its final destination.

Contractor-Furnished Items and Services

The following items may be included in a contract as part of the special equipment, ground support, and documentation needs:

1. Unaltered copies or original documents from an applicable State certifying agency should be retained by the Contractor for fill material, which must be presented to the Forest Service prior to shipment of fill material at project areas.
2. The Contractor is responsible for cleaning of all vehicles and equipment to ensure that they are free of soil, seeds, vegetative matter, or other debris that could contain or hold non-native noxious weed seed and reproductive plant parts prior to entering Forest Service lands or private lands. Contractor must provide written certification of compliance with terms for cleaning vehicles and equipment prior to moving onto job site.

Required Documentation from Contractors

In addition to daily operational reports and a final report, required documents for a contract should include:

1. Written notification to the COR of proposed material sources __ days prior to use.
2. Written documentation of Contractor expertise and methods used to determine weed-free status of any and all materials furnished by a Contractor.
3. Written certification of compliance with terms for cleaning vehicles and equipment prior to moving onto job site.