Sources of Data Providing Land Use and Land Cover Estimates for the U.S.

(next update: 2016)

This document provides a crosswalk between major Federal land use and land cover datasets and provides details on the definitions, coverage, and methodologies used by the agencies. The purpose of this document is to clarify the differences between land use and land cover data and to facilitate users' understanding of the comparability of these data. Various U.S. Federal agencies produce land use or land cover estimates. Some agencies produce estimates for the entire U.S., while others produce estimates covering fewer land or ownership types; for many agencies the scope and scale of the estimates are designed to meet specific legislated mandates passed by Congress. Just as the scope and scale of the mandates differ widely, so do the estimates that are produced. This document supports an international effort to improve access to and usability of agricultural and rural statistics worldwide (see box).

How does land use differ from land cover?

Land *use* and land *cover* are often related, but they have different meanings. Land *use* involves an element of human activity and reflects human decisions about how land will be used. Land *cover* refers to the vegetative characteristics or manmade constructions on the land's surface. For example, after a timber harvest land cover has changed, but the land use of that area will not have changed if seedlings were planted or natural regeneration is occurring and it will continue to be used for timber production. Often, different methods are used to develop land use and land cover estimates. Land use is generally determined by surveys based on field observations or enumeration, while land cover is generally determined using remote sensing techniques or aerial photography interpretation.

The table below summarizes the land use and land cover estimates produced by various Federal agencies. Click on the Agency names in the column headings to see agency-specific details about their data collection. Click on the land categories in the left column for a comparison of the definitions used by the various agencies.

Citation: Nickerson, C., M. Harper, C.J. Henrie, R. Mayberry, S. Shimmin, B. Smith and J.H. Smith. 2013. "Sources of Data Providing Land Use and Land Cover Estimates for the U.S." Report prepared for the Interagency Council on Agricultural and Rural Statistics, subcommittee of the Interagency Council on Statistical Policy.

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ICARS (Interagency Council on Agricultural and Rural Statistics) activity helps identify, describe, and harmonize agricultural and rural data produced by the Federal Government. ICARS was formed in support of the "Global Strategy to Improve Agriculture and Rural Statistics" which was developed under the United Nations Statistical Commission.

Land Use and Land Cover Estimates for the U.S., by Source

	Land Use					Hybrid LU/LC	Land Cover	
	USFS	BLM	NASS	Census Bureau	ERS	NRCS	USGS	BLM
Scope of coverage	*All forest land*	*area managed by BLM*	*land in farms only*	*urban areas only*	*all land uses*	*all non-Federal land*	*all land and water cover*	*area managed by BLM*
Category	*in millions of acres*							
Forest/woodland	751	11	75	--	671	409	600	69
Forest in timber use		*11*	*46*	--	*544*		--	--
Forest in grazed uses			*29*	--	*127*		--	--
Permanent pasture/ range	--	158	409	--	614	529	995	174
Cropland	--	--	406	--	408	390	311	--
Urban areas	--	--	--	68	61	112*	102	--
Rural parks, wilderness areas		2	--	--	252	--	--	--
Rural transportation	--	--	--	--	26	*	--	--
Other		85	32		232	504	373	13
Total area included in estimates	751	256	922	68	2,264	1,944	2,381	256

Total U.S. land area: 2,264 million acres (source: Census Bureau)
Total U.S. land and water area: 2,381 million acres (source: USGS)

Year estimates were derived	**2007**	**2007**	**2007**	**2010**	**2007**	**2007**	**2006****	**2007**
Number of US States included	50	26#	50	50	50	49*	50	26#
U.S. Territories	##		##	##		##	##	

Notes:

*NRCS combines Urban areas and Rural Transportation into a Developed Land category. NRCS estimates exclude AK.

**USGS data are from 2006, except AK and HI estimates are from 2001.

BLM estimates exclude states that do not contain surface acres managed by BLM.

Agency has estimates available for some land categories - see links to agency websites on the following pages.

Descriptions of Data Sets, Scope and Methodologies

U.S. Forest Service (USFS)

Description of data: The Forest Inventory and Analysis (FIA) provides estimates of forest land by owner and status (reserved, unreserved, productive, unproductive, cover type, etc) and associated attributes such as volume, biomass, growth, mortality, removals, health, disturbance, etc which may also be used as area estimate qualifiers.

Frequency:
Mandated in 1928 as a forest monitoring program across all forest ownerships in the U.S. Mandated statewide assessments (county level data) on a 5-year basis and mandated national assessments in 1953, 1963, 1970, 1977, 1987, 1992, 1997, 2002, 2007 and every 5 years thereafter in compliance with the Forest and Rangeland Renewable Resources Planning Act of 1974 (P.L. 93-378, 16 U.S.C. 1601) and the Forest and Rangeland Renewable Resources Research Act of 1978 (P.L. 95-307, 16 U.S.C. 1641+). Annualized survey allows statewide data updates of forest attributes each year using online databases available to the public.

Scope and Basic Approach:

- FIA is a comprehensive field-based inventory of all forest ownerships using remote sensing and over 125,000 uniformly distributed permanent field samples on forest land and 200,000 sample points on nonforest land across all 50 states and U.S. affiliated islands of Puerto Rico, U.S. Virgin Islands , American Samoa, Guam, the Republic of the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, and the Republic of Palau. A systematic subsample of plots is measured each year in each state (20% in each state in the East and 10% in each state in the West).
- The agency routinely canvasses all primary wood-using facilities in the U.S. provide critical information to support estimates of timber removals from the forest field survey.
- Studies of the attitudes and objectives of private forest landowners conducted by the agency in concert with the field survey provide additional information on opportunities and issues related to overall management of the nation's forests.
- The FIA program continues to conduct pilot studies to monitor urban areas to provide a more robust picture of forest cover in the U.S., which is broader than the more definition restricted context of forest use. Urban forest pilot studies of CO and TN have been conducted over the last 5 years. Recently, a collaborative study of urban forest has begun in CA, OR, WA, AK and HI.
- Rangeland pilot studies with NRCS/BLM in OR and with National Forest Systems in WY.
- Current projects include collaborative work with USGS National Land Cover Dataset (NLCD) on verifying the forest cover layer and with NASA on more rapid land cover/land use estimation techniques.

Intended Uses of the Data: The Forest Service Forest Inventory and Analysis (FIA) program formation is used in many ways, such as evaluating wildlife habitat conditions, assessing the sustainability of ecosystem management practices, and supporting planning and decisionmaking activities undertaken by public and private enterprises. FIA management is participatory with its partners and clients with a structure outlined in the FIA strategic plan at http://www.fia.fs.fed.us/library/fact-sheets/overview/FIA_Strategic_Plan2.pdf FIA inventory data provides the primary strategic planning data for state-level forest planning and policy development for each of the 50 States as well as broader information on the extent, status and trends of all of the nation's forests which are presented in comprehensive national assessments every 5 years. The agency's data on forest biomass and carbon form the authoritative basis of U.S. reporting of forest carbon to the United Nations Intergovernmental Panel on Climate Change (IPCC).

For more information: www.fia.fs.fed.us

Bureau of Land Management (BLM)

Description of data:

- Land Use: for rangeland is determined by the number of acres designated for grazing use as reported in BLM's Performance and Accountability Report. Land Use for forest and woodlands is determined by the number of acres actively managed for timber production as reported in BLM's Performance and Accountability Report. "Other" category for Land Use includes rangelands not grazed by livestock, forested lands not managed for timber production, aquatic areas and wetlands, lands devoted to energy development, and wilderness not managed for timber production or livestock grazing. Areas within BLM administered National Monument not used for timber or livestock grazing are listed as "Rural parks, wilderness areas". These areas are reported in the Resource Management Plans for the 16 National Monuments administered by the BLM. Areas in National Monuments that are currently grazed or that are managed for timber production are included in the "Forest in timber use" or "Permanent pasture/range" categories.
- Land Cover: Wetland acres are reported in a Condition Table in the Public Land Statistics. Forest and woodland cover are reported in BLM's Performance and Accountability Report. Number of acres of Rangelands is derived by subtracting acres of wetlands and acres of forest and woodlands from total BLM acres. BLM is in the process of completing ecological site inventories and descriptions, which will provide a more complete tally of rangelands. "Other" category for Land Cover includes wetlands and aquatic areas.

Frequency: Total land managed by BLM is reported annually in Public Land Statistics. The Performance Accountability Report and Public Land Statistics are also published annually.

Scope and Basic Approach: BLM's Land Use and Land Cover estimates are compiled from multiple reports identified above. Each of the reports listed above can be accessed through the BLM internet home page using the link below. The Land Use and Land Cover reports include surface acres managed by BLM in Alabama, Alaska, Arizona, Arkansas, California, Colorado, Florida, Idaho, Louisiana, Maryland, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Virginia, Washington, Wisconsin, and Wyoming. Land Use acreage is reported by the dominant use, usually either grazing or timber harvest.

Intended Uses of the Data: The data used to generate the Land Use and Land Cover estimates is used to report to Congress and the public the land uses allocated in BLM Resource Management Plans.

For more information: www.blm.gov Search in the Information Center for the two reports and the sixteen National Monument Plans.

National Agricultural Statistics Service (NASS)

Description of data: The Census of Agriculture is the leading source of facts and figures about American agriculture. Conducted every five years, the Census provides a detailed picture of U.S. farms and ranches and the people who operate them. It is the only source of uniform, comprehensive agricultural data for every state and county in the United States.

NASS land data is exclusive to farm operations only and consists of agricultural land used for crops, pasture, or grazing. Also included is woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm operator's total operation. Land in farms includes acres in the Conservation Reserve, Wetlands Reserve Programs, or other government programs.

Land in farms includes land owned and operated as well as land rented from others. Land used rent-free is included as land rented from others. All grazing land, except land used under government permits on a per-head basis (which operators have difficulty estimating), is included as land in farms provided it was part of a

farm or ranch. Land under the exclusive use of a grazing association is included as land in farms. All land in American Indian reservations used for growing crops or grazing livestock is included as land in farms.

Frequency: The Census of Agriculture is mandated and is conducted every 5 years.

Scope and Basic Approach: Covers all 50 states. NASS relies on many sources to develop the list of potential producers which receive a Census questionnaire. These sources include but are not limited to producer associations, community based organizations, and public records. The Census of Agriculture includes agricultural operations that earn or could earn >=$1,000. Publicly owned land, such as land owned by USFS, BLM or other Federal or State agencies, and public institutions, and used on a per-head basis is excluded.

Intended Uses of the Data: The Census of Agriculture provides information and historical trends on land in production agriculture used by farm operators. Generally the data and trends are more reliable at higher levels of aggregation.

For more information: http://www.agcensus.usda.gov/index.php

Natural Resources Conservation Service (NRCS)

Description of data: The National Resources Inventory is conducted by the U.S. Department of Agriculture's Natural Resources Conservation Service in cooperation with Iowa State University's Center for Survey Statistics and Methodology. It provides updated information on the status, condition, and trends of land, soil, water, and related resources on the Nation's non-Federal lands. Non-Federal lands include privately owned lands, tribal and trust lands, and lands controlled by State and local governments.

Frequency: The Rural Development Act of 1972 directed the Secretary of Agriculture to implement a land inventory and monitoring program and to issue a report on the conditions and trends of soil, water, and related resources at intervals not exceeding 5 years. The Soil and Water Resources Conservation Act (RCA) of 1977 and other supporting legislation augmented the statutory mandate for periodic assessment of the Nation's natural resources. Data are collected with the specific goal of supporting agricultural and environmental policy development and program implementation.

Data are collected on an annual basis and reported every 5 years. The longitudinal database enables nationally consistent trending. The latest inventory is the 2007 NRI which provides nationally consistent data for the 25-year period 1982-2007. The 2012 NRI is expected to be released in 2014.

Scope and Basic Approach: The universe of interest for the NRI survey consists of all surface area (land and water) of the United States including all 50 States, Puerto Rico, the U.S. Virgin Islands, and certain Pacific Basin islands. The NRI sample was established on a county-by county basis, using a stratified, two-stage, area sampling scheme. The two stage sampling units are (1) nominally square segments of land, and (2) points within the segments (about 300,000 sample segments and 800,000 sample points). The sample covers all land ownership categories, but the type of data reported for Federal land is limited to area estimates.

The NRI uses the term land cover/use to identify categories that account for all the surface area of the United States so it uses a hybrid of land cover and land use. In the NRI, land cover is the vegetation or other kind of material that covers the land surface. Land use is the purpose of human activity on the land; it is usually but not always related to the land cover. Cropland, for example, is basically a land use category that includes a variety of land covers (grass, trees, shrubs, bare soil, small grains, etc.); it is classified primarily by its use and secondarily by its cover. In contrast, forest land is basically a land cover category that includes a variety of uses or multiple concurrent uses; it is classified primarily by its cover and secondarily by its use. The NRI term Land

Cover/Use permits land with both crops and trees to be properly assigned to a specific, non-overlapping NRI category.

The NRI has established linkages to the NRCS Soil Survey Program; the data gathering process relies heavily upon information contained in the National Soils Information System. NRI data collection is accomplished in remote sensing laboratories with the use of photo interpretation of special high-resolution imagery. Local NRCS staff utilize Field Office records to obtain certain data elements that are not easily determined through photo interpretation (e.g., cropping histories, erosion model prediction factors, participation in conservation programs, and unique landscape features). Historical data and numerous types of auxiliary data are also utilized.

NRCS has begun collecting NRI on-site data on rangelands managed by BLM under an interagency agreement. The NRI framework is also the basis of other types of data collection: NRI grazing land on-site surveys, Conservation Effects Assessment Program, soil monitoring network, rapid carbon assessment.

Intended Uses of the Data: The NRI survey program provides scientifically valid, comprehensive, and relevant data on how U.S. non-Federal rural lands are being used, and on natural resource and environmental conditions for these lands, with the specific goal of supporting agricultural an environmental policy development and program implementation. Estimates are reported at 5-year intervals and are statistically significant at the national, state, and some sub-state levels. Information derived from the NRI is used by natural resource managers; policymakers and analysts; consultants; the media; other Federal agencies, State governments; universities; environmental, commodity, and farm groups; and the public. Historically, NRI information has been used to formulate effective public policies, to fashion agricultural and natural resources legislation, to develop State and national conservation programs, to allocate USDA financial and technical assistance in addressing natural resource concerns, and to enhance public understanding of natural resources and environmental issues. NRI data are designed to be part of the core components of the agency's strategic planning and accountability efforts, and to help assess consequences of existing legislative mandates, such as the appraisals required by the Resources Conservation Act and the periodic Farm Bills.

For more information: http://www.nrcs.usda.gov/technical/nri

Census Bureau

Description of data: The Census Bureau's urban-rural classification is fundamentally a delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses. The Census Bureau identifies two types of urban areas: urbanized areas (UAs) of 50,000 or more people and urban clusters (UCs) of at least 2,500 and less than 50,000 people. Non-Urban, or "Rural", encompasses all population, housing, and territory not included within an urban area.

Frequency:

- The Census Bureau identifies and classifies urban and rural areas after each decennial census.
- Urban areas have been identified since 1906. Prior to the 1950 census, "urban" was defined primarily as any population, housing, and territory located within incorporated places with a population of 2,500 or more.
- UAs were first defined for the 1950 Census and UCs were first defined after the Census 2000. Both UAs and UCs are primarily defined to describe densely settled territory.

Scope and Basic Approach:

- For the 2010 Census, an urban area comprises a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. The Census Bureau identifies and qualifies additional nonresidential urban-related territory that is noncontiguous, yet near the urban area. As a final review, the Census Bureau examines the territory surrounding the urban areas associated with a high degree of impervious surface land cover and determines whether they should be included in an urban area. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters.

- These data represent the territory that qualified as urban based on the results of the 2010 Census of Population and Housing for the United States, Puerto Rico, and the Island Areas (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands). This territory was identified by the Census Bureau using the urban area criteria published in the **Federal Register** on August 24, 2011 (76 FR 53030). All criteria based on land area, population, and population density, reflect the information contained in the Census Bureau's Master Address File/Topologically Integrated Geographic Encoding and Referencing (MAF/TIGER) Database (MTDB) produced for the 2010 Census. The data used to define impervious surfaces are limited to only those that are included in the Multi-Resolution Land Characteristics Consortium's (MRLC) 2001 National Land Cover Database (NLCD) or NLCD 2006 update where available. The estimated 68 million acres of urban territory excludes approximately 1 million acres of land use identified as urban in Puerto Rico and the Island Areas.

Intended Uses of the Data: The Census Bureau's urban are rural classification provides an important baseline set of urban and rural areas for tabulation and presentation of statistical data for use in the analysis of changes in the distribution and characteristics of urban and rural populations. In delineating urban areas, the Census Bureau does not take into account or attempt to meet the requirements of any nonstatistical uses of these areas or their associated data.

For more information: Additional information about the 2010 Census urban area delineation criteria and products can be found: http://www.census.gov/geo/www/ua/2010urbanruralclass.html.

Economic Research Service (ERS)

Description of data: ERS' Major Land Use (MLU) series is the longest running, most comprehensive accounting of all major uses of public and private land in the United States. The series was started in 1945.

Frequency: Estimates of land in all uses are published every 5 years coincident with the Census of Agriculture.

Scope and Basic Approach: The MLU series provides state and national land use estimates for all 50 States. Data from USDA's Forest Service, National Agricultural Statistics Service, the U.S. Census Bureau, Bureau of Land Management, Natural Resources Conservation Service, conservation agencies, and other sources were compiled by State to estimate the uses of several broad classes and subclasses of land in 2007. Standardized procedures were used to develop the estimates. Estimates of cropland, urban area, rural transportation and rural parks/wilderness areas, which are based largely on census data and administrative data, are developed first. The estimates of forest-use land and pasture and range are then developed, followed by 'other' land uses. Though all land-use categories require reconciliation among sources at the State level, some categories in the MLU series are adjusted more than others based on the residual amount of land after other uses are tabulated. These categories include 'other' land and, to some extent, pasture and range—categories for which less reliable data sources are available relative to cropland and forest-use areas.

Intended Uses of the Data: These estimates can be used to identify long-term trends in land uses at the state level. In general, more confidence should be put in the broader land-use trends over decades rather than specific 5-year fluctuations. County level estimates of all land uses are not available.

For more information: http://www.ers.usda.gov/data-products/major-land-uses.aspx. The summary report based on 2007 data can be downloaded here: http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib89.aspx

U.S. Geological Survey (USGS)

Description of data: The National Land Cover Database (NLCD) serves as the definitive Landsat-based, 30-meter resolution, land cover database for the Nation. It provides spatial reference and descriptive data on the characteristics of the land surface such as thematic class (for example, urban, agriculture, and forest), percent impervious surface, and percent tree canopy cover. The NLCD supports a wide variety of Federal, State, local, and nongovernmental applications that seek to assess ecosystem status and health, understand the spatial patterns of biodiversity, predict effects of climate change, and develop land management policy. It is created by the Multi-Resolution Land Characteristics (MRLC) Consortium, a partnership of Federal agencies led by the U.S. Geological Survey. The other federal agencies involved and their primary responsibilities are the: National Agricultural Statistics Service (agricultural classes); U.S. Forest Service (forest canopy data); Environmental Protection Agency (accuracy assessments); National Oceanic and Atmospheric Administration (coastal zones); National Aeronautic and Space Administration (Landsat support); Bureau of Land Management (grasslands and shrublands); National Park Service (reference data); US Fish and Wildlife Service (reference data) and Army Corps of Engineers (reference data). All NLCD data products are available for download at no charge to the public.

Frequency: For the conterminous US (48 states) the NLCD is updated every five years. Alaska, Hawaii and Puerto Rico are done in conjunction with other federal mapping efforts.

Scope and Basic Approach: The objective of the National Land Cover Database (NLCD) is to provide the Nation with nationally complete, current, consistent, and public domain information on the Nation's land cover. It is derived from remotely sensed imagery acquired by the Landsat satellite, which is combined with other imagery and in-situ reference data to produce accurate land cover information as efficiently as possible. It undergoes a rigorous accuracy assessment which is reported in peer-reviewed journals.

Intended Uses of the Data: The NLCD has been developed for scientists and resource managers to conduct analyses on the impacts of land surface change on environmental quality, resource degradation and community sustainability. It has been formatted for ease-of-use in geographic information system analyses and modeling activities. Examples of applications include: assessing water quality in the Chesapeake Bay; developing sampling methodologies in forest and rangeland inventories; modeling forest fire behavior and assessing community vulnerability to natural hazards.

For more information: www.mrlc.gov

Definitions of land categories by agency

Forest

USFS: The USFS defines forest as land at least 120 feet wide and 1 acre in size with at least 10 percent cover (or equivalent stocking) by live trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forestland includes transition zones, such as areas between forest and nonforest lands that have at least 10 percent cover (or equivalent stocking) with live trees and forest areas adjacent to urban and built-up lands. Roadside, streamside, and shelterbelt strips of trees must have a crown width of at least 120 feet and continuous length of at least 363 feet to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if they are less than 120 feet wide or an acre in size. Tree-covered areas in agricultural production settings, such as fruit orchards, or tree-covered areas in urban settings, such as city parks, are not considered forest land.

BLM: BLM defines forest as lands where the potential natural community contains 10 percent or more tree canopy cover. BLM defines woodlands as a forest in which the trees are often small, characteristically short-boled relative to their crown depth, and forming only an open canopy with the intervening areas being occupied by lower vegetation, commonly grass.

NASS: Only land associated with a farm operation is included within the data series. Includes planted woodlots or timber tracts, cutover and deforested land with young growth which has or will have value for wood products and woodland pastured. Land covered by sagebrush or mesquite was reported as Permanent pastureland and rangeland or other land. Land planted for Christmas tree production and short rotation woody crops was reported in Cropland harvested, and land in tapped maple trees was reported as Woodland not pastured.

NRCS: A *Land cover/use* category that is at least 10 percent stocked by single-stemmed woody species of any size that will be at least 4 meters (13 feet) tall at maturity. Also included is land bearing evidence of natural regeneration of tree cover (cut over forest or abandoned farmland) and not currently developed for nonforest use. Ten percent stocked, when viewed from a vertical direction, equates to an areal canopy cover of leaves and branches of 25 percent or greater. The minimum area for classification as forest land is 1 acre, and the area must be at least 100 feet wide.

Census Bureau: N/A

ERS: The USDA Forest Service's inventories of forested land are the primary basis for the *Major Land Uses* (MLU) estimate of forest-use land. The ERS forest-use category includes both grazed and ungrazed forests but excludes an estimate of forestland in parks, wildlife areas, and similar special-purpose uses from the USDA Forest Service's inventory of total forest land. See more on definitions and sources in Appendix 1 and 2 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS: Areas characterized by tree cover (natural or semi-natural woody vegetation, generally greater than 6 meters tall); tree canopy accounts for 25% to 100% of the cover.

Permanent pasture/ range

USFS: N/A

BLM: Land on which the indigenous vegetation (climax or natural potential) is predominately grasses, grass-like plants, forbs or shrubs and is managed as a natural ecosystem. If plants are introduced, they are managed similarly. Rangelands include natural grasslands, savannas, shrublands, many deserts, tundras, alpine communities, marshes and meadows.

NASS: Includes grazable land that does not qualify as woodland pasture or cropland pasture. It may be irrigated or dry land. In some areas, it can be a high quality pasture that could not be cropped without improvements. In other areas, it is barely able to be grazed and is only marginally better than wasteland. Publicly owned land that is grazed, such as land owned by USFS, BLM or other Federal or State agencies, and public institutions, used per-head basis is excluded.

NRCS:

Pastureland - A *Land cover/use* category of land managed primarily for the production of introduced forage plants for livestock grazing. Pastureland cover may consist of a single species in a pure stand, a grass mixture, or a grass-legume mixture. Management usually consists of cultural treatments: fertilization, weed control, reseeding or renovation, and control of grazing. For the NRI, includes land that has a vegetative cover of grasses, legumes, and/or forbs, regardless of whether or not it is being grazed by livestock.

Rangeland - A *Land cover/use* category on which the climax or potential plant cover is composed principally of native grasses, grasslike plants, forbs or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland. This would include areas where introduced hardy and persistent grasses, such as crested wheatgrass, are planted and such practices as deferred grazing, burning, chaining, and rotational grazing are used, with little or no chemicals or fertilizer being applied. Grasslands, savannas, many wetlands, some deserts, and tundra are considered to be rangeland. Certain communities of low forbs and shrubs, such as mesquite, chaparral, mountain shrub, and pinyon-juniper, are also included as rangeland.

Census Bureau: N/A

ERS: Grassland pasture and range encompass all open land used primarily for pasture and grazing, including shrub and brushland types of pasture, grazing land with sagebrush and scattered mesquite, and all tame and native grasses, legumes, and other forage used for pasture or grazing—regardless of ownership. Because of the diversity in vegetative composition, grassland pasture and range are not always clearly distinguishable from other types of pasture and range. At one extreme, permanent grassland may merge with cropland pasture, or grassland may often be found in transitional areas with forested grazing land. The estimates in this report are composites of data from the National Resources Inventory (NRI), Census of Agriculture, the Bureau of Land Management, USDA Forest Service, and several other Federal agencies. The 614 million acres classed as grassland pasture and range in 2007 included 409 million acres in farms reported by NASS. Also included are estimates of private grazing land not in farms and public, nonforested grazing land. See more details on definitions and sources in Appendix 1 and 2 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS: One of three classes:

Shrub - areas characterized by natural or semi-natural woody vegetation with aerial stems, generally less than 6 meters tall, with individuals or clumps not touching to interlocking.

Grasslands - areas characterized by natural or semi-natural herbaceous vegetation; herbaceous vegetation accounts for 75% to 100% of the cover.

Pasture - areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.

Cropland

USFS: N/A

BLM: N/A

NASS: includes cropland harvested, failed/abandoned cropland, cultivated summer fallow, cropland idled/cover crops or soil improvement, and cropland used only for pasture or grazing.

NRCS: A *Land cover/use* category that includes areas used for the production of adapted crops for harvest. Two subcategories of cropland are recognized: cultivated and noncultivated. Cultivated cropland comprises land in row crops or close-grown crops and also other cultivated cropland, for example, hayland or pastureland that is in a rotation with row or close-grown crops. Noncultivated cropland includes permanent hayland and horticultural cropland.

Census Bureau: N/A

ERS: Total cropland includes five components: cropland harvested, crop failure, cultivated summer fallow, cropland used only for pasture, and idle cropland. The estimate of total cropland in 2007 included total cropland as reported by the 2007 Census of Agriculture (USDA/NASS) plus an upward adjustment to conform to data on principal crops harvested in each State as reported by the National Agricultural Statistics Service for 2007. See more on definitions in Appendix 1 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS: areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.

Urban areas

USFS: N/A

BLM: N/A

NASS: N/A

NRCS: ***Developed Land:*** The category of *developed land* differs from that used by some other data collection entities. For the NRI, the intent is to identify which lands have been permanently removed from the rural land base, while other studies are interested in human populations (e.g., Census of Population) and housing units (e.g., American Housing Survey). The NRI developed land category includes (a) large tracts of urban and built-up land; (b) small tracts of built-up land of less than 10 acres; and (c) land outside of these built-up areas that is in a rural transportation corridor (roads, railroads, and associated rights-of-way).

> **Urban and built-up:** A *Land cover/use* category consisting of residential, industrial, commercial, and institutional land; construction sites; public administrative sites; railroad yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment plants; water control structures and spillways; other land used for such purposes; small parks (less than 10 acres) within urban and built-up areas; and highways, *railroads*, and other transportation facilities if they are surrounded by urban areas. Also included are tracts of less than 10 acres that do not meet the above definition but are completely surrounded by Urban and built-up land. Two size categories are recognized in the NRI: Small -- areas of 0.25 acre to 10 acres, and Large -- areas of at least 10 acres.
>
> **Rural transportation land.** A *Land cover/use* category which consists of all highways, roads, railroads

and associated right-of-ways outside *urban and built-up areas*; also includes private roads to *farmsteads or ranch headquarters*, logging roads, and other private roads (field lanes are not included).

Census Bureau: For the 2010 Census, an urban area comprises a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. The Census Bureau identifies and qualifies additional non-residential urban-related territory that is noncontiguous, yet near the urban area. As a final review, the Census Bureau examines the territory surrounding the urban areas associated with a high degree of impervious surface land cover and determines whether they should be included in an urban area. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The Census Bureau identifies two types of urban areas: urbanized areas (UAs) of 50,000 or more people and urban clusters (UCs) of at least 2,500 and less than 50,000 people. Non-urban, or "rural," encompasses all population, housing, and territory not included within an urban area.

ERS: Urban areas in the ERS MLU series follow the Census Bureau urban areas definition. Inter-census estimates are extrapolated. See more on definitions in Appendix 1 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS: areas characterized by a high percentage (30% or greater) of constructed materials (e.g. asphalt, concrete, buildings, etc.).

Rural parks and wilderness areas

USFS: Although USFS does not report these area estimates separately, rural parks and wilderness areas are field sampled within the FIA framework and detailed estimates of resources on these lands can be developed using spatial polygon overlays of the sampling grid.

BLM: Includes lands which are not grazed within BLM managed National Monuments. Lands in BLM managed National Monuments that are grazed are reported in the "Permanent Pasture/Range" land use category.

NASS: N/A

NRCS: Maintained areas (e.g., hard surfaced areas such parking lots and buildings, mowed or landscaped areas) within rural parks/wilderness areas are classified as built-up and are included in the land cover/use category of Developed Land (see Urban Areas and NRCS Scope and Basic Approach regarding hybrid land cover/use categories). Other areas (e.g., forested and grassland acres contained within rural parks/wilderness areas owned by non-Federal agencies) are included in the forest, pasture and range categories as appropriate. Forested and grassland acres contained within rural parks/wilderness areas owned by Federal agencies are included in the 'other' category.

Census Bureau: N/A

ERS: includes national parks and wilderness areas include areas in national and State park systems. Wildlife areas include areas administered by the U.S. Fish and Wildlife Service and State wildlife agencies. See more details on definitions and sources in Appendix 1 and 2 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS:N/A

Rural transportation

USFS: N/A

BLM: N/A

NASS: N/A

NRCS: Included within the land cover/use category of Developed Land (see Urban Areas above).

Census Bureau: N/A

ERS: Includes highways, roads, and railroad rights-of way and airports outside urban areas. See more details on definitions and sources in Appendix 1 and 2 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS: N/A

Other

USFS: N/A

BLM: The "Other" category for Land Use includes rangelands not grazed by livestock, forested lands not managed for timber production, aquatic areas and wetlands, wilderness, and lands devoted to energy development. The "Other" category for Land Cover includes wetlands and aquatic areas.

Wetlands (areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions) include marshes, shallows, swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas.

Riparian areas are defined as a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

NASS: Includes land in farmsteads, buildings, livestock facilities, ponds, roads, wasteland, etc.

NRCS: Includes other rural land, Federal land and water areas:

Other rural land. A *Land cover/use* category that includes farmsteads and other farm structures, field windbreaks, barren land, and marshland.

Federal land. A land ownership category designating land that is owned by the Federal Government. It does not include, for example, trust lands administered by the Bureau of Indian Affairs or Tennessee Valley Authority (TVA) land. No data are reported for any year that land is in this ownership.

Water areas. A *Land cover/use* category comprising water bodies and streams that are permanent water.

Census Bureau: N/A

ERS: Includes national defense and industrial areas; farmsteads and farmroads; and miscellaneous other uses, such as industrial and commercial sites in rural areas, cemeteries, golf courses, mining areas, quarry sites, marshes, swamps, sand dunes, bare rocks, deserts, tundra, rural residential, and other unclassified land. Defense and industrial uses based on areas administered by the U.S. Department of Defense and Department of Energy as of 2007. Farmsteads and farm roads are estimated based on the State-by-State number of farms and acreage of unclassified land in farms from the Census of Agriculture. Farmstead area was computed using the average based on National Resources Inventory data (USDA/NRCS) multiplied by the number of farms reported by USDA/NASS for 2007. Miscellaneous land and low density residential land from the NRCS National Resources Inventory. Other estimates are based on reports and administrative records of the Census Bureau and Federal and State land management agencies. See more details on definitions and sources in Appendix 1 and 2 of the most recent Major Land Uses Report at http://www.ers.usda.gov/Publications/EIB89.

USGS: Includes:
Water - areas of open water or permanent ice/snow cover.
Bare ground - areas characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life.
Wetlands - areas where the soil or substrate is periodically saturated with or covered with water.