Rural Living

in Santa Cruz County, Arizona

A guide to resources and regulations for country living.

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If you’re reading this book, chances are you have just moved into Santa Cruz County or are considering purchasing property here. However, if you’ve lived here a long time and just want to learn more about rural living – we think you’ll find the information in the following pages useful too! Southeastern Arizona is one of the most beautiful and diverse areas of the United States, and there are special considerations that you should be aware of to maintain that diversity and beauty. Many newcomers are unfamiliar with the legal and regulatory requirements, or the special safety considerations, and are unaware of the sensitivity of the natural environment that may have enticed them here in the first place. This book is designed as a guide to assist you to live in harmony with the land and your neighbors, both human and non-human!

Southeastern Arizona’s past and present reflect a myriad of human cultures tied to the land. From ancient agrarians harvesting communal crops to present day ranching, farming and mining, this area of Arizona has provided an abundance of scenic and natural resources that have supported people whose “way of life” depends on those resources. The future quality of life and the natural beauty of Santa Cruz County will depend on the decisions made now, by all of us who choose to make our homes here.

In this handbook, you will find brief descriptions of the history and ecology of the area, introduction to rural living, suggestions for land management, information about your wildlife neighbors, and resources for more in-depth information on specific subjects.

This guide has been developed by the Santa Cruz County Natural Resource Conservation District, a subdivision of state government directed by a locally elected board, the National Audubon Society, and the Coronado Resource Conservation and Development Area, Inc. through a grant from the USDA-Natural Resources Conservation Service.
Santa Cruz County is Arizona’s smallest county and is located in the southernmost central part of Arizona, bordering Mexico and serving as the gateway to North America. The history of the region dates back to the cultures of the Apache, Yaqui and Hohokam peoples who built their communities along the Santa Cruz River, Sonoita Creek and Harshaw Creek, whose waters flowed year round and provided ideal sites for agriculture and ranching.

In 1539 the Spanish explorer and Franciscan monk, Fray Marcos de Niza, was the first European to visit the area, entering near present-day Lochiel on the Mexican border. Coronado’s expedition also entered the region in the 16th century in search of the legendary Seven Cities of Gold.

Nearly a century and a half later in the late 1600s, the Spanish sent the Jesuit priest Padre Eusebio Francisco Kino to the region to establish missions and map the territory for Spain. For the next two decades this extraordinary man, known as a humanitarian, farmer, cattle rancher, explorer, mathematician, cartographer and geographer, traveled through Southern Arizona spreading the Catholic faith and teaching people how to farm.

Father Kino named the region Santa Cruz or “holy cross” based upon the odd flow of the river. The river from which the county gets its name begins in the San Rafael Valley, winds south through Mexico then makes a 40 mile U-turn, reentering the United States at Nogales, Arizona. From there it flows north to where it disappears again near Picacho Peak, flowing underground to join the Gila River that flows through Phoenix.

In 1752, after an uprising by the Pima Indians, the Spanish Crown established New Spain’s northernmost outpost and Europe's first settlement in Arizona at what is now Tubac. By 1853, the Gadsden Purchase formed the southeastern corner of Arizona, then Mexico, making it part of the United States. Santa Cruz County was officially created in 1899 by Arizona's 20th Territorial Assembly.

Santa Cruz County serves as the gateway to North America's most important port of entry, Nogales, Sonora, Mexico. While one of the state's smallest counties, Santa Cruz County is also one of Arizona's most diverse and interesting destinations, offering an eclectic blend of history, culture, art, recreation, shopping, cuisine and entertainment in a beautiful and relaxing setting. From the artist colony of Tubac to the historic national monuments at Tumacacori, to the twin border towns of Nogales, Arizona and Mexico, to the mountain and birding town of Patagonia, to Arizona's wine country in Sonoita & Elgin, a journey though Santa Cruz County will intrigue, stimulate and satisfy the senses!
In contrast to eastern and mid western states, many western states, including Arizona, are largely composed of government land. To understand the reasons for this situation it is necessary to review some history. At the end of the Mexican War (1848) the United States acquired much of the area now included in the state of Arizona. The area south of the Gila River, which includes much of Southeastern Arizona, was acquired by the United State from Mexico in the Gadsden Purchase (1853) mainly to secure a good route to build a transcontinental railroad.

The policy of the U.S. government was to dispose of that land in several ways. The Homestead Act, passed in 1862 (and there were a number of subsequent Homestead Acts into the 20th century), aimed at transferring land to private individuals for farming and ranching purposes. Some government land was reserved for the Indian tribes and held by the government in trust for those tribes. In the early 1900s, much of the higher elevation land in Arizona was reserved by the government as National Forests. The federal government also established a system of land grants to the states for the purpose of supporting the common schools, an agricultural and mechanical college (which became known as the “land-grant colleges”), and some other state institutions. In Arizona, four sections in every township were designated as state lands. Where these sections had already been reserved for Indian Reservations, National Forests, National Parks, Military Reservations or other purposes, the State was allowed to select other government lands in lieu of those designated sections. The remaining land was considered the “public domain” available for transfer to private ownership by homesteading or mineral development.

Unfortunately, the Homestead Acts were designed mainly for mid western farming country, and failed to recognize the large amount of land required to make a living in the semi-arid west. Although later versions of the Homestead Act increased the amount of land that could be claimed from 160 to 640 acres (one square mile), this was “too little, too late.” Therefore, settlers homesteaded the areas where water was present in rivers and springs and ran their livestock over the rest of the public domain. The “wars” between the cattlemen and the sheepmen were a result of conflict over these open rangelands and furnished the basis for many Hollywood movies. The government owned the land, but had no policy of controlling the use of it. The only way ranchers could control this land was to stock it heavily so that others would not move in to harvest any surplus grass. This led to widespread overstocking of the range in the late 1800s and the early 1900s.

When the National Forests were established in the early 1900s, the Forest Service allocated grazing rights to those ranchers already using the federal range, established stocking rates and charged grazing fees to cover the costs of administering the grazing. However, this type of control was not established on the remaining “public domain” until passage of the Taylor Grazing Act in 1934. Today, federal rangelands are administered either by the National Forest Service or by the federal Bureau of Land Management. In both cases, the lands are considered to be “public lands” and are managed for multiple uses, e.g. grazing, timber, minerals, hunting, recreation, wildlife, water, etc. Permits are issued (usually for 10 years) to grazed specified numbers of livestock on these federal lands and a grazing fee is charged for each animal unit month (AUM) of grazing. Ranchers generally must have private “base property” (which can be either land or water rights or both) that is used in conjunction with the federal land. Ranchers holding a federal grazing permit must comply with certain terms and conditions designed to protect the land and minimize conflict with other uses. Federal grazing permits can usually only be obtained by buying the whole ranch, or in some cases by applying for a permit that is “vacant.” In general, these “public lands” can be used by the public for hunting or recreational purposes without a special permit, although sometimes fees are charged for use of campgrounds or other facilities.

The lands granted to the State of Arizona are called “state trust lands.” Southeastern Arizona has a lot of state trust lands because when Arizona became a state in 1912, large areas of other parts of the state had already been reserved for Indians, National Forests, Military Reservations, or National Parks. Therefore, the
ARIZONA IS A PUBLIC LAND STATE CONTINUED...

state had to select lands from those remaining. According to the “Enabling Act”, these state trust lands are to be managed to provide revenue to the beneficiaries of the state land trust. These include the schools, the land grant college (University of Arizona), the prisons, and certain other state institutions. Accordingly, the policy in management of state trust lands is to derive a stable long-term income from these lands, not to manage them as “public lands.”

State land can only be used with a permit issued specifically for the use intended. The most common use of state land is for livestock grazing. The state lease specifies the number of animals that can be grazed and a fee is levied for each animal unit month of grazing. All fences, wells, corrals or other improvements placed on a state grazing lease must be approved by the State Land Department. The rancher pays a fee for placing these facilities on state land and must construct and maintain the facilities according to standards of the State Land Department. In addition, the lessee pays personal property taxes to the County for these improvements on state land. In the event that the state lease is cancelled or awarded to another individual, the lessee must be compensated for the value of the improvements placed on state land.

There are other categories of state leases. Some state lands are leased for farming (agricultural leases). Some lands are commercial leases for various non-agricultural purposes. The state also issues permits for fuel wood cutting, sand and gravel operations, rights of way for utilities or access, or other purposes. Recreational uses on state land also require a permit. A valid hunting or fishing license is considered to be a permit to use state land (with some restrictions where it might interfere with another lessee). Hiking, camping, horseback riding, use of recreational vehicles, bird watching, etc. require a state recreational permit. All of these permits involve payment to the State Land Department.

THE PUBLIC LAND SURVEY SYSTEM

Newcomers from the East may not be familiar with the Public Land Survey System used in Arizona and most of the West. This was a system established to identify lands by a rectangular grid, rather than the system of “metes and bounds” traditionally used in Europe and in the eastern United States. Metes and bounds involves identifying specific points and measuring the distance and bearing (compass direction) to the next identifiable point. In the Public Land Survey system (PLS) large areas of land (encompassing one or more states) were laid out in a pattern of townships and sections. Starting from an initial point an east-west “baseline” and a north-south “principal meridian” were established. Townships were laid out in 6-mile intervals along the baseline and principal meridian, i.e. each township is 6 miles on a side and contains 36 square miles or sections. Townships are numbered north and south of the baseline, i.e. Township 3 south goes from 12-18 miles south of the baseline. East and west of the principal meridian, the townships are also numbered in 6-mile intervals called “ranges.” Thus, Township 3 south, Range 3 east would start 12 miles south and 12 miles east of the baseline and principal meridian, respectively. Baseline Road in Phoenix is the baseline from which townships in Arizona are measured. The principal meridian is also in the Phoenix area.

Each township contains 36 square miles or sections. Each section is one mile on a side and contains 640 acres. Sections can be divided into half sections (320 acres), quarter sections (160 acres), quarter-quarter sections (40 acres), etc. The PLS system surveyed most of the country and established markers with a brass cap indicating the corners of sections, quarter sections and occasionally other points. The legal description of most land in Arizona is described by the township, range, section or portion of a section. Thus a 10 acre tract might be described as the northwest quarter of the southeast quarter of the southwestern quarter of section 10, Township 20 South, Range 14 East, or in shorthand NW ¼, SE ¼, SW ¼, S10, T20S, R14E. This system is not as neat as it sounds. One reason is that north –south lines tend to converge toward the north (they all end at the North Pole!) so the grid is not truly rectangular. By convention, all the errors due to convergence are thrown into the north and west side of townships, so that some sections along these sides may have “lots” that contain less than the expected number of acres. Also, the early surveys did not have the benefit of modern surveying equipment and thus placed section markers in the wrong places. Some mountainous areas still have no actual marked corners on many sections.
An agricultural classification means that a property’s value for tax purposes is based on the property being used for agricultural production rather than on market value. This can mean less property tax to pay. The definition of agricultural land is:

“A parcel of land used the previous two years and presently is used as a farm or ranch, and the gross income from such use equals or exceeds one-third of the total gross income resulting from all uses of the property during any given property tax year. Such land must have been classified or eligible for classification as agricultural land during the 10 years preceding the year of assessment. Such land must continue to have actual agricultural use. Agricultural land includes land underlying any residence improvement located on such agricultural land and also includes the land underlying other improvements if such improvements are an integral part of the farm or ranch. The use of a portion of such land for hunting, fishing or other wildlife purposes, for monetary profit or otherwise, shall not affect the classification of agricultural land.”

An agricultural classification may also apply to lands not considered farms or ranches. A parcel of land with at least forty forested acres used to produce wood products for the primary purpose of obtaining monetary profit would fit into this category. These lands are subject to forest management plans.

All other agricultural property not meeting the above-mentioned criteria is classified as “all other property” and valued using appropriate consideration of the three approaches to appraisal based on its actual use on the assessment date. Vacant land is also valued using these considerations.

Improvements used solely and exclusively for agricultural purposes and water rights are appraised and valued with the land. All other improvements are appraised and valued separately from the land.

To maintain an agricultural classification, land must continuously be used for agricultural purposes. The owner must be able to provide the county assessor clear evidence of such use. Two primary criteria used as evidence are: 1) physical review, and 2) with taxpayer documentation.

All residences are valued at the same rate whether they are in a rural or urban setting. The land is what may receive an agricultural classification and thus a lower assessed valuation. For more information, contact the County Assessor in the county in which the land is located.

An important part of the statute concerns the qualification of the land as a “farm” or “ranch”. Farm means a parcel of land, which is used to produce agricultural products that originate from the land’s productivity for the primary purpose of obtaining a monetary profit. Ranch means a parcel of land, which is used for grazing livestock for the primary purpose of a monetary profit.
BEFORE YOU BUILD IN SANTA CRUZ COUNTY

BUILDING PERMITS AND BASIC ZONING REQUIREMENTS IN SANTA CRUZ COUNTY

Santa Cruz County requires building permits for residential, accessory and commercial structures and additions. The building permit process also includes the permitting of: septic systems; right-of-way permits (for driveways or private roads connecting to county-maintained roads); Floodplain Use Permits for structures proposed in a 100-year floodplain; and grading permits under certain circumstances. Electrical and plumbing permits are also required for certain work.

Information about obtaining these permits can be obtained by calling the Santa Cruz County Central Permits Office at (520) 375-7879 and (520) 375-7907.

Residential Zoning Districts:
The zoning regulations include various residential Zoning Districts. These districts protect areas where people live. They allow residential uses as a right so long as zoning code requirements are met, such as setbacks from the property line, building height and lot sizes. Contact the Planning Department to obtain information on getting a permit for a residence.

SANTA CRUZ COUNTY CENTRAL PERMITS OFFICE
2150 North Congress Drive, Suite 117
Nogales, AZ 85621
(520) 375-7879

The placement of mobile homes is very controlled within the County and may only be done on properties specifically zoned for such a structure, without a variance.

For more information, visit:
http://www.co.santa-cruz.az.us/com_development/index.html

Non-Residential (Commercial) Permits:
County zoning regulations include various Zoning Districts where commercial and industrial uses are allowed so long as development plan approval and a building permit are obtained.

Maps showing the districts are available at the Planning Department. Zoning can also be provided over the telephone by providing a valid Tax Assessor Parcel Number.

The Zoning Districts define areas where businesses, warehouses and factories can be operated with minimum impact upon residential areas.

Non-residential uses, such as bed & breakfasts, churches and schools, may be permitted in residential neighborhoods upon approval of a Conditional Use Permit (see below).

Conditional Use Permits and Policies:
Conditional uses are activities which, because of their unique characteristics, potentially could generate greater impacts than uses already permitted in a Zoning District. Due to these greater impacts, conditional uses must be reviewed and acted upon by the Board of Adjustment at a public hearing.

Examples of conditional uses include: bed and breakfast inns, RV parks, communication towers, adult care homes and churches.

For more information: Contact the Planning and Zoning Department at
(520) 375-7930

http://www.co.santa-cruz.az.us/com_development/planning.html

Zoning and Development Code and Comprehensive Plan:
The Santa Cruz County Zoning and Development Code and the Comprehensive Plan are both available on-line at:

http://www.co.santa-cruz.az.us/com_development/index.html
**Light Pollution:** If you’ve never lived in a rural, isolated area the darkness can be intimidating. However, the dark night skies have brought many people to Santa Cruz County, amateur and professional astronomers – and folks who just enjoy seeing multitudes of stars. Please give the dark night skies a chance – you may learn to love them. Consider the following tips to reduce light pollution:

1. **Select Motion Sensitive Lights:** These can be positioned to light walkways or other areas where security is needed, and only come on when needed.

2. **Select Appropriate Fixtures:** Select outdoor fixtures that are or can be “fully shielded”. This means they control the light to shine downward, none above 45 degrees. If your fixture does not have a “full cut off” shield, it is often easy to add one using a piece of sheet metal. High lumen output fixtures are often not needed to provide adequate light. More light is not better; often it is worse!

3. **Select Appropriate Lamps:** Preferred outdoor lamps in southern Arizona are: fluorescent (efficient white light) and incandescent (least efficient white light) Prohibited outdoor lamps are: mercury vapor and quartz if unshielded.

4. **Select Energy Efficient Fixtures:** All lamps will have a wattage and, usually, a lumens rating. Look for fixtures with lamps having higher lumens with lower wattage for better energy efficiency. They often cost more initially, but last longer and save lots of operating money.

**Water Conservation:** It is illegal to distribute, sell, offer for sale, import or install any plumbing fixture that does not comply with the water efficiency standards of the Arizona Water Efficient Plumbing Act of 1992 (HB2440) effective January 1, 1994. All new and renovated residential, commercial, industrial and public construction as defined in the Act. Copies of the complete Act are available at the County Planning Department.

http://www.co.santa-cruz.az.us/com_development/planning.html

**Wells:** Many areas of Santa Cruz County are not served by municipal water systems, so you may have to depend on water withdrawn from a well on your property. If you have not yet purchased property, research carefully to be certain that a dependable, adequate supply of groundwater will be available for current and future needs. If there is no well on the property, Arizona Department of Water Resources* can provide information about wells drilled on nearby home sites for comparison. There is no guarantee that a new well will reach extractable water, and in many areas of Santa Cruz County, the depth to groundwater has dropped significantly in the past several years. Groundwater recharge in the region is very slow, and often a well that has been pumped dry will not recover. Always use water carefully and wisely, for it is a precious commodity here in Santa Cruz County. Anyone who resides in an area who intends to drill, deepen, replace, or modify a well can obtain a Notice of Intent to Drill from the Arizona Department of Water Resources (ADWR) or from the County Health and Social Services, Environmental Health Division. The applicant must fill out the Notice of Intent to Drill and return it to one of the agencies stated above. There is a fee required. The department requires a minimum of five (5) days to review the application and schedule inspection of the site.
Rangeland Improvements
- State rangelands require permits to place improvements. Applications must be filed with the Arizona State Land Department with a filing fee before project activity can begin.

Archaeology
- Areas that will be disturbed must have a cultural clearance that complies with SHPO (State Historic Preservation Office) requirements.
- Archaeological surveys must be conducted by professionals certified to do them.
- If an archaeological significant site is present, the best solution is to move the proposed activity so that it does not impact the site.
- Once an authorized agency has determined that there is no impact and files the report with SHPO, a clearance letter will be issued and the project may proceed.

Threatened and Endangered Species
- An authorized state or federal agency must determine, in an environmental assessment, if threatened or endangered species are present.
- If Threatened and Endangered species are not present, no additional action is required.
- If Threatened and Endangered species are present, a Section 7 consultation with United States Fish and Wildlife Services (USFWS) is required to determine the extent of the project impact on the species.
- If there is no or minimal impact, or the project can be designed to eliminate impacts, a permit will be issued.

Water Rights
- An application for water rights must be filed if the project involves structures that will impound water or will use ground water.
- Applications are filed with the Arizona Department of Water Resources (ADWR).
- The procedure for surface water rights involves filing the notice of application in a local paper for three weeks to allow downstream users the opportunity to protest.
- If water rights applications are protested, ADWR waits 450 days for applicant to resolve the issue before continuing the process.
- If applications are not protested, ADWR issues a permit to construct, checks the project after construction and, if all requirements are met, then issues a water right.

Native Plant Law
Many plants in Arizona are rare and unusual, and may be protected by Arizona statute. Even plants on your own land may be protected. Don’t put yourself or the plants at risk—check it out before you dig!
http://www.azda.gov/esd/nativeplants.htm
INSTALLING CONSERVATION PRACTICES OR LAND IMPROVEMENTS IN SANTA CRUZ COUNTY—THE PERMIT PROCESS CONTINUED...

US Army Corps of Engineers (COE) 404 permit
• Permits are required for any earth moving activity that will result in discharge of dredged or fill material into waters of the US, including wetlands.
• Areas that are not jurisdictional do not need a permit.
• Applications are letters submitted along with the project design.
• The Corps can issue a letter of permission if the project has a minimal or no impact and construction can begin.
• The Corps has nationwide permits that cover several areas. If activity fits under a nationwide permit, the application letter should address that. The Corps will issue a letter and regulations on the nationwide permit that must be followed to be in compliance.
• If a permit is required, the Corps will review the project and determine whether or not to issue a permit. If a permit is issued, the cost is $10 or $100 depending upon the applicant’s affiliation.

State Water Quality 401 permit
• A state water quality 401 permit is required any time a COE 404 permit is required.
• It is also required any time a National Pollutant Discharge Elimination System (NPDES) 402 permit is required (this is a point discharge source of pollution).
• Permit applications are available from the Arizona Department of Environmental Quality (ADEQ)

County
• Floodplain permits are required for any construction project. (See information box below.)
• Burn permits are also required.

Floodplain Use Permit:
WHAT IS THE FLOODPLAIN? The floodplain is any area, which will be covered by water during or after a flood.

A floodplain use permit is required before building permits can be issued. The floodplain use permit is an official document, which authorizes specific activity within the regulatory floodplain and/or erosion hazard area. Regulated activities include any improvements, temporary construction, fencing, drainage alterations, and/or erosion protection along any wash with a base flood (1% probability) discharge greater than 50 cubic feet per second (cfs).

WHO NEEDS A FLOODPLAIN USE PERMIT? Any party planning to alter the natural flow of water, any channel, or to construct within any floodplain area or erosion hazard setback in the unincorporated area of Santa Cruz County. The Floodplain Administrator may approve work without a permit if all proposed construction/development is outside the floodplain and/or erosion hazard areas.

You can obtain floodplain information and the use permit by contacting Santa Cruz County personnel at the following address:
Santa Cruz County
Flood Control District & Floodplain Admin.
County Complex, Ste. 117
2150 N. Congress Drive
Nogales, AZ 85621
Phone: (520) 375-7830
Fax: (520) 761-7930
TDD: (520) 761-7816
http://www.co.santa-cruz.az.us/ flood
There are many people in Santa Cruz County experimenting with alternative building materials. Everyone has his/her own reasons for doing so, from plain curiosity to a desire for a more environmentally friendly living space. Often, there is a long-term economic payoff that makes these choices attractive. This is because these alternative materials generally provide great insulation by blocking the flow of heat through the material; in other words, they have a high R-value. In effect, the temperature inside the structure remains more constant, making the use of air conditioners and heaters less necessary, and the energy bills lower!

The following are a few of the alternative materials being used in Santa Cruz County:

**Earthen Building Materials:** Earthen building materials, such as adobe and rammed earth, are advantageous because of their thermal mass. This means that the material stores heat and helps regulate the temperature inside the structure.

- **Adobe:** Adobe is considered by some to be a traditional alternative building material, having been used by people for thousands of years. In Santa Cruz County, one can find historic adobe buildings, some of which have been restored. Many people are rediscovering adobe for home-building as well. Adobe is usually made out of sand, clay, and sometimes a fibrous material, such as straw. After the mixture is made, it is put into forms to make bricks. The bricks are sun-dried and then used.

- **Rammed Earth:** One can find rammed earth homes scattered throughout Santa Cruz County. Rammed Earth is composed of sand, gravel and clay. The mixture is compressed in forms to create walls. This compression can be done completely by hand, or with mechanical tools. Rammed earth is a fairly labor intensive building method, but it can be done by anyone, and it uses local building materials.

- **Straw Bale:** Currently, this is the most prevalent alternative building material in the county. Because of this, there is a good local knowledge base to draw from for those just starting out; workshop opportunities abound. Some people build on their own, while others use a contractor. Yuma, AZ and California are the most popular places to get bales for building in Santa Cruz County. Bales from Yuma are usually wheat or barley. Farmers in California are no longer allowed to burn rice, so they have started baling it and this has become another source of bales in the county. Straw bales make for very thick walls and this allows for creativity with nooks and window ledges. Some people caution that if passive solar principles (see below for more information) are not incorporated into the design, straw bale structures run the risk of feeling cave-like.
**ALTERNATIVE BUILDING CONTINUED...**

- **Post-Consumer Polystyrene Waste/Cement Blocks:** Many homes in Santa Cruz County have been built using one of several types of block that combines recycled polystyrene (keeping it out of landfills!) and cement. These blocks are highly rated for insulation (both temperature and noise), are load-bearing and easy to handle. A search for “Polystyrene cement blocks” in a search engine will return many brand name options, some even manufactured here in Arizona!

- **Paper Crete (or Fibrous Concrete):** Paper Crete is not commercially available, but does not require any special machine to make so it’s a natural for the do-it-yourselfer – it can even be cut with a chain saw! Blocks are made by blending recycled paper, sand, cement, and water into a slurry. Once mixed, either by hand or mixer, the slurry is poured into forms to dry. The paper in this material makes it highly insulating. Currently, there are no Paper Crete buildings in Santa Cruz County, however, school students, teachers, and community members have experimented with this material and have constructed benches. The closest Paper Crete building can be found in Nogales, Sonora.

- There are a few **AAC (autoclaved aerated concrete) and earth-shelter** homes in Santa Cruz County as well.

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It is important to note that alternative building options are not only open to those doing new construction. Retrofit options do exist.

Along with these alternative materials, are some new, or rather revitalized old, ways of thinking about building. Incorporating ‘passive solar’ into the design of the structure is one example. Passive solar is where sunlight is used for energy without the help of any mechanical device. In building, this amounts to maximizing the sun as a heat source in the winter and minimizing it in the summer. To do this, for example, one thinks about the orientation of the proposed structure in relation to the sun, where windows will be located, etc. This, combined with highly insulative materials, makes for a pretty energy efficient home; however, this is only the beginning. There are many more alternative materials and building principles out there to try and Santa Cruz County is a great place to start looking.
ECOLOGICAL CONDITIONS OF S.E. ARIZONA

Plant and animal life in Southeastern Arizona is very diverse, partly because the landscape is diverse and partly because it represents a “meeting place” where flora and fauna typical of the subtropical regions of Mexico blend with the more temperate species of the Great Basin, the Great Plains, and the Rocky Mountains. Four main factors govern the occurrence of plant communities in the area: precipitation, temperature, soil type, and topographic position.

**Precipitation**

Because the area is semiarid, moisture is a primary limiting factor for the plant growth, and for the animals dependent on the plants for food and shelter. Annual precipitation averages 17.5 inches. “Average” precipitation is just that, an average, and doesn’t guarantee anything! Drought conditions, when less than “average” precipitation occurs, are more the rule than the exception. Usually over half of this comes as thunderstorms during the summer “monsoons” which come into the state from Mexico in July-September. Some rain (and snow at higher elevations) comes from the west coast during the months of December-April. The winter rains tend to be more general and less intense than the summer rains.

**Soil Type**

The chemical and physical properties of the soil often dictate the kind and amount of vegetation within a general precipitation/temperature regime. Heavy clay soils may support entirely different kinds of plants than a sandy soil, mainly due to differences in ability to absorb and store soil moisture.

**Temperature**

Average temperatures decrease as the altitude increases (a rule of thumb is 3 degrees F for each 1,000 feet of altitude). Even the lowest areas are subject to frost during the winter months. June is generally the hottest month; the monsoon rains cool things off a little later in the summer, although the higher humidity of the monsoon makes the heat less enjoyable.

**Topography**

Low-lying areas may support entirely different vegetation than the nearby uplands for two main reasons. One is that additional moisture may occur in and adjacent to the drainages. The other is that cold air tends to drain off the mountains and uplands and accumulate in the valleys, especially on clear, still winter nights. This creates a temperature “inversion” where the low-lying areas are much colder than the uplands. Cold sensitive plants, i.e. the saguaro cactus, often will not grow in low-lying areas.
The combination of the factors soil, temperature, topography and precipitation result in the following distinct “life zones” in Southeastern Arizona.

**Desert Shrub:** The valley bottoms and lower foothills of the mountains are composed of desert shrub vegetation. These areas are generally below 3,500 feet elevation and receive 7-12 inches of precipitation. Creosote bush, whitethorn acacia, mesquite and other shrubs dominate the vegetation with a sparse understory of summer growing perennial grasses and herbs and often good growth of winter annuals when rainfall is favorable. Most of Southeastern Arizona is characterized by the Chihuahuan Desert vegetation typical of New Mexico, Texas and the Mexican state of Chihuahua. Some areas in the northwestern part of the region have the Sonoran Desert vegetation type characterized by the occurrence of saguaro and numerous other cacti that do not occur in the Chihuahuan Desert type.

**Semi-desert (or Semi-arid) Grassland:** This zone from around 3,500-5,000 feet in elevation is characterized by perennial grasses that grow in the warm season, especially after the summer monsoon. Forbs (wildflowers) and an occasional tree or shrub add to the diversity of a healthy grassland. Grasslands need periodic fires to prevent conversion of grasslands to shrub lands or woodlands.

**Oak/Pine/Chaparral:** From 5,000-7,500 feet elevation and about 16-20 inches of annual rainfall, there is a “woodland” zone, which may be characterized by live oak, ponderosa pine, or chaparral (vegetation composed of Manzanita, desert ceanothus, mountain mahogany, cliffrose, or other shrubs).

**Pine/Mixed Conifer:** From about 7,500-10,000 feet (when the mountain gets that high) is a forest zone composed of several species of pines and other conifers. The “mixed conifer” type has several species of fir and spruce and resembles the spruce-fir forest of the Rocky Mountains.

**Riparian Zone:** Rivers, streams and even “dry” washes may support plant communities that need a reliable source of water. The surrounding mountains and grasslands provide watersheds that supply these riparian areas, allowing sycamores, cottonwoods, willow species, walnuts, ashes, and many other shrubs and trees to survive. Cienegas” are marshy areas where the water table is shallow and flooding is frequent.

**Vegetative Growth Forms:**
- Forest – Dominated by trees, nearly continuous canopy
- Woodland or Savanna – Dominated by trees, but with large open spaces between trees or groups of trees. Grasses and wildflowers a big component
- Shrubland – Nearly continuous canopy of shrubs (low woody species up to several meters in height)
- Scrub – Shrubs widely spaced. May have some grasses and wildflowers.
- Desert – Sparse plant cover, ground surface mostly bare
- Grassland – Dominated by grasses with wildflowers and widely spaced shrubs or trees
SANTA CRUZ COUNTY
MOVES TOWARD SUSTAINABILITY
- By Marshall Magruder

We are blessed with a wonderful place to live, play, work and have fun. There are several limits to retaining our County. We need clean air, water and land.

Clean Air
Our air has particulate matter, called PM-10, from dust, smoke and diesel exhaust. We are an EPA non-attainment area due to higher than standard PM-10 readings. The new mandated biodiesel fuel and new diesel engines will remove some of these particles with time. We have a dust requirement for new construction and the numbers of unpaved roads slowly are decreasing. Most of the particulates in our county’s air come across the border due to the prevailing winds from the south. There is an EPA bi-lateral commission working on these areas.

Clean Water
We are required to have safe water for humans. The City of Nogales and parts of Rio Rico are connected to the Nogales International Wastewater Treatment Plant in southern Rio Rico. It also is connected to a pipe from Nogales, Sonora, where we receive up to 15 million gallons of water to treat. This plant is undergoing a $60 million upgrade to add more capacity and higher levels of treatment to remove additional contaminants. The effluent from this plant supports nearly continuous water flowing in the Santa Cruz River to the northern part of the County. This clean effluent has restored the cottonwood bosque, now the largest in the United States, along its path. In addition, most new developments are also required to have sewage systems.

Clean Land
We have very little contaminated soil, such as from old gasoline tanks, that is slowly being rehabilitated. Old mine tailings and ponds leach several toxic minerals including lead, arsenic, and mercury into our waters. Only Lake Peña Blanca remains contaminated with lead. None of these now leak into our water supplies, but there is concern about some mines at the southern end of the Santa Rita Mountain range, just north of S.R. 83 and in the old Solaro Mine area where arsenic has been leaching into the soil for over 50-years. Some water supply companies are now non-compliant with the new EPA arsenic levels in water, which changed from 50 ppb to 10 ppb. For example, the American Arizona Water (Tubac) has about 30 ppb and is installing a filtering system to become compliant.

Clear Skies
Our recent countywide “dark skies” ordinance, developed in cooperation with the Smithsonian/University of Harvard Mount Whipple Observatory, was approved and will be implemented. Our light pollution, primarily from lights that shine upward (where there is nothing to see) or are multi-spectral, make extensive background “noise” that interferes with the observatory and many local amateur astronomers here. This ordinance will extend the capabilities of this most valuable scientific organization for decades to come. We are committed to having dark skies here.

Municipal Improvements
Santa Cruz County is the first county in Arizona to add a hybrid car to its fleet of vehicles. The county has received a grant to change out old fluorescent light fixtures and bulbs for newer more energy efficient ones and the new Detention/Judicial Center will be Leadership in Engineering and Environmental Design (LEED) certified.
WATER IN THE DESERT

WATER LAW:
A LAW ENFORCEMENT PERSPECTIVE

Locally, adjudicated water is measured in cubic feet per second (cfs). We also find “shares” of water from the various irrigation companies. These companies have appropriated water for use by their stockholders who pay for its delivery from maintained canals by the “share”. Shares vary in size, depending on the water company.

Just because water flows across a piece of property doesn’t mean the property owner can use the water. Frequently, complaints arise when property owners run siphon hoses or water pumps from ditches to gardens without a water right. Since appropriated water for beneficial use belongs to the user and has a dollar value, law enforcement views the taking of water without right as a “theft”.

A statute also exists which states that any person who knowingly and willfully interferes with the flow of water with intent to (do so)…is guilty of a misdemeanor. Many of these situations occur due to ignorance and not necessarily an intent to deprive a user of water. In such cases, a criminal citation may not be necessary. But the violator can also be placed on notice and a continuance after notification would cover the “knowingly” requirement of the statute.

New folks moving into this area must also realize that a water owner has the right to check and clean the ditch. Don’t assume that you have a trespasser; a friendly “Hello, how are you?” is probably more appropriate than a call to the sheriff’s office. And to the water users, remember that you do have an obligation to keep your ditches clean and in good repair so as not to create a potential flooding problem.

Rainfall patterns are extremely spotty and drought occurs about every seven years interspersed with frequent small-scale droughts. Annual rainfall ranges from around 8” in the valleys to 35” in the mountains. About half of the rainfall occurs during what is know as the summer monsoon season of July, August and September. This rain comes in the form of brief, but often heavy, showers and thunderstorms. Winter rains are generally light- moderate, more soaking showers. The growing season typically begins mid-March or April and ends in September, but can extend into October.

A SHORT HISTORY AND
EXPLANATION OF WATER MEASUREMENT UNITS

The terms, second-foot, cubic foot per second and foot of water, are interchangeable. Cubic feet per second (cfs) is the most common usage. One cfs is about 1 acre-inch per hour or 2 acre-feet per day. An acre-foot is the amount of water required to cover 1 acre 1 foot deep. To convert cfs to gallons per minute (gpm), the common unit for sprinklers, multiply cfs by 448.8 to get gpm.

Most measurement in our ditches is through a “parshall flume”. The depth of water is measured in inches off a scale in the parshall, and then easily converted to cfs with the use of a playing-card-sized chart available from an irrigation company. As pipelines replace more ditches, flow meters sometimes replace parshalls and read directly in gallons per minute. Bureau of Reclamation flow meters read in acre-feet. The conversion from acre-feet to gpm is acre-feet measured over a 24 hour period x 226.2 = gpm.

Why is water measurement such an important issue? Just look across the fence. Disagreements over irrigation water probably outnumber marital disputes as the leading cause of shouting matches. The more you know about water measurement, the more constructive your discussions with ditch partners can be.
Your Drinking Water Quality
If you are in a rural area not served by municipal water, there are water quality factors of which you should be aware. A safe, reliable water source is part of a quality rural environment. To assure that quality, chemical analysis is recommended to detect contaminants such as nitrates, sodium, chlorides and the hardness capacity of water. Labs in the State of Arizona are equipped to determine the chemical constituents of water. Bottles for sampling can be obtained from the local county health department.

The appearance, taste or odor of water offers some information on obvious contamination; however, this is not the case with all contaminants. Laboratory analysis is the only sure way to determine the quality of your water. Obvious contaminants include silt (cloudiness) and hydrogen sulfide (smell). Generally, the senses will not detect impurities that cause hard water, corrode pipes and stain sinks.

Domestic Water Conservation
Living in the desert requires that the community be more water conscious. Although there are parts of Santa Cruz County that have more surface water than other areas (the Patagonia area for example), water is still a scarce resource throughout the county. For this reason, the practice water conservation should be a way of life for those who live here. The Arizona Department of Water Resources (ADWR) points out that water conservation is not only necessary in maintaining our standard of living, but is also critical for a healthy economy.

Much of Arizona’s water needs have been met through the use of groundwater. The pumping of aquifers – underground bodies of water held in lower levels of dirt and rock – has caused significant drops in groundwater levels. In some of these areas, the lack of water in the last fifty years has put enough pressure on locals that they relocated. In contrast, the rapid growth of Arizona’s urban areas has increased water constraints. Growing populations are contributing to the shift from a state that, historically, used the majority of its water for agricultural purposes to one that has seen a significant increase in municipal applications.

To ensure the availability of water for future Arizonans, the ADWR Assured Water Supply (AWS) Program is working to preserve groundwater and promote long-term water supply planning. The AWS Program regulates the amount of groundwater allocated to new subdivisions, requiring a “Certificate” of Assured Water Supply by “Designated” Water Providers and has worked for an AWS for subdivisions. This means that the AWS Program is able to protect consumers from over development and ensure that residents will have a sufficient water supply before housing is even built.

Rainwater Harvesting can reduce the amount of groundwater used for landscaping. Passive rainwater harvesting can include xeriscaping, which is covered later in this section. Harvesting rainwater can also be more intentional. Many residents of Santa Cruz County collect rainwater from the roofs of their houses in containers to use for landscaping. Scott Calhoun, a rainwater harvesting teacher at the Pima Cooperative Extension Office, has said that a 2,000 sq. foot roof could capture around 15,000 gallons of water a year in Tucson. These figures would differ in Santa Cruz County, but would still be significant. Brad Landcaster, a rainwater harvesting expert, has been quoted saying that a household could easily cut their water uses by a third simply by implementing a rainwater harvesting system.
DOMESTIC WATER CONSERVATION CONTINUED...

By definition, Xeriscape landscaping is landscaping designed specifically for areas that are susceptible to drought, or for properties where water conservation is practiced. Derived from the Greek *xeros* meaning "dry," the term, xeriscape means literally "dry landscape."

Originally developed for drought-afflicted areas, the principles of xeriscape today have an ever broadening appeal and can be applied to all or part of a yard in any region of North America. With water now considered an expensive and limited resource, all landscaping projects, residential or commercial, can benefit from this alternative. Xeriscapes do not have a single look. Almost any landscaping style can be achieved but a common element is the reduction of lawn grass areas, since lawn grass is often one of the largest users of water. For most of North America, over 50% of residential water used is applied to landscape and lawns. Xeriscape can reduce landscape water use by 50 - 75%. A key component of xeriscape landscaping is the use of indigenous plants, since they are adapted to the local climate and consequently require less water. Plants most suited to xeriscape landscaping are sometimes referred to as "xeric" plants.

**In addition to water conservation, Xeriscape landscaping has multiple other benefits:**
1. Less Maintenance. Aside from occasional pruning and weeding, maintenance is minimal. Watering requirements are low, and can be met with simple irrigation systems.
2. No Fertilizers or Pesticides. Using plants native to your area will eliminate the need for chemical supplements. Sufficient nutrients are provided by healthy organic soil.
3. Improves Property Value. A good Xeriscape can raise property values which more than offset the cost of installation. Protect your landscaping investment by drought-proofing it.
4) Pollution Free. Fossil fuel consumption from gas mowers is minimized or eliminated with minimal turf areas. Small turf areas can be maintained with a reel mower.
5) Provides Wildlife Habitat. Use of native plants, shrubs and trees offer a familiar and varied habitat for local wildlife.

**CREATING A XERISCAPE PLAN FOR YOUR PROPERTY**  
Source: www.eartheasy.com

Before setting pencil to paper, familiarize yourself with the 7 Principles of Xeriscaping and take a tour of your local nurseries to see what drought-resistant plantings are available locally. Using graph paper, draw an aerial view of your property and begin your plan with the following considerations:

1. The fundamental element of Xeriscape design is to reduce the amount of applied water and to maximize the use of natural precipitation ~ orient the plot by marking down north, south, east and west. Include any limiting features such as trees, fences, walkways or structures. Note areas of sun and shade, which will help you establish zones of differing water needs. You'll want to group plants with similar watering needs for most efficient water use. 
   ~ study the natural contours and drainage patterns of the land. These contours can be easily developed into terraces, which add visual interest and help reduce soil loss and erosion due to rain or irrigation. Terraces can be as little as 3” and still offer visual appeal; terraces over 12” will require considerable support, such as rock walls or timbers reinforced with steel stakes.
   ~ consider the planned use of each area within the plot. Areas for seating, walkways, visual barriers, dining or play should be defined and incorporated into your plan.
   ~ areas to be left as turf should be designed to be easily mowed. Curved swaths are usually better than straight runs with sharp turns. Narrow swaths can be difficult to water with conventional sprinklers.
   ~ larger plantings, such as shrubs and trees, can be positioned to provide natural heating and cooling opportunities for adjacent buildings.

2. Soil Improvement
   The ideal soil in a water-conserving landscape does two things simultaneously: it drains quickly and stores water at the same time. This is achieved by increasing the amount of organic material in your soil and keeping it well aerated. Compost is the ideal organic additive, unless your xeriscape contains many succulents and cacti. These species prefer lean soil.
These are just a few water conservation methods being used in Santa Cruz County.

For more information, please feel free to contact the Arizona Department of Water Resources (www.azwater.gov).

Another resource of Santa Cruz County is the University of Arizona Cooperative Extension Office
http://cals.arizona.edu/santacruz/
LIVING WITH WILDLIFE  
MAKING YOUR PROPERTY WILDLIFE FRIENDLY

Wildlife Habitat = Food + Water + Cover

Wildlife habitat is being lost as more land is subdivided, bringing houses, people, livestock, dogs, cats, and other intrusions. Landowners can help offset this loss of wildlife habitat by growing a diversity of vegetation that provides food and cover for wildlife.

Food requirements will naturally vary by wildlife species, from the seeds and berries required by birds, to the grasses, forbs, and shrubs preferred by deer.

Water on or near your property in the form of a pond, stream, or developed stock water will increase the variety of wildlife you can attract.

Cover is needed for hiding from predators, and for travel corridors, nesting, and shelter.

Riparian Areas

Riparian areas support the greatest variety and abundance of wildlife in Arizona. Because livestock also favors riparian areas, they require special management. While livestock should be fenced out of some riparian areas, others can be lightly grazed during the hot-growing season with little damage to wildlife habitat. Livestock should be excluded from degraded riparian areas until vegetation is fully recovered. Cattle troughs, feeders, and salt blocks should be placed well away from riparian areas to prevent trampling of banks and overgrazing.

Fences

Fences can inhibit wildlife movements and cause physical injury or death through entanglement. Net or woven wire fences should be avoided if possible because they are the most difficult for wildlife to cross. A 4-strand barbed wire fence should have 12 inches between the top two strands, and the bottom strand should be smooth and at least 16 to 22 inches above ground. Three equally spaced wire stays will keep the fence rigid, thereby preventing animals from entangling their legs when jumping over.

Water Development

Livestock troughs should be constructed and maintained with wildlife use in mind. Water developments should provide a dependable source of water all year, even when livestock are not in the area. When trough height is 20 inches or less, javelina and young deer will have access to the water. To reduce the hazard of wildlife drowning, troughs should contain a ramp or escape ladder and water storage tanks should be covered or equipped with an escape ramp.
Brush Removal

Many species of wildlife require areas of dense vegetation for nesting and escape cover. Shrubs are important browse for deer. Brush removal that selectively leaves areas of browse and cover will be more beneficial for deer than extensive brush removal projects. If cover is in short supply, brush piles that result from other land treatments can increase nesting and protection cover.

Livestock Grazing

Year-round grazing tends to reduce wildlife habitat quality. Grazing can be timed to favor production of early-season forbs preferred by deer, or to increase grass cover important to ground-nesters.

Snag Removal

Dead or dying standing trees (snags) that pose no safety hazard should be left on site for wildlife. Over 85 species of North American birds use cavities in snags, and bats and squirrels depend on snags for roosting and breeding sites. Many of these species consume large quantities of insects, which, if left unchecked, can become major agricultural pests.

ENHANCING YOUR PROPERTY FOR WILDLIFE

After making your property “wildlife friendly”, you may want to enhance habitat or create additional habitat for wildlife. If so, you will need to identify the requirements of the target species and any factors limiting its occurrence on your property. Techniques that duplicate natural forces, such as fires that create openings, offer the cheapest and most effective means of providing wildlife with habitats they have adapted to through time.

Where good forage plants are present, reduce competition with less desirable plants or protect from overuse by livestock. Mechanical crushing and controlled burning can be used to create openings and invigorate “over mature” browse. However, habitat manipulations to encourage some species will discourage others.

Hedgerows provide escape, refuge and nesting cover, as well as travel lanes for wildlife. Low, woody vegetation can be planted along fence lines as part of a windbreak, in gullies to control erosion, and around ponds, springs, and food patches. Native species should have priority in any planting program. Hedgerows should be at least 15 to 20 feet wide to be effective.

Bird nest boxes and nest platforms, artificial squirrel nests, raptor-safe roosts on power poles, and artificial bat roost boxes are just a few of the many other improvements that will benefit wildlife.

FOR HELP

• To develop a plan for improving wildlife habitat on your property, contact your local USDA Natural Resources Conservation Service, Arizona Game & Fish Department, or visit your library or local bookstore.

• For information about ordering trees and shrubs that wildlife prefer, contact the Arizona State Land Department or ask your local nursery to suggest some native shrub and tree species adapted for your area.

• Information on pond development is available from the USDA Natural Resources Conservation Service and the Arizona Game and Fish Department.
GUIDELINES FOR LIVING WITH WILDLIFE

#1: Be tolerant. Most of our wild neighbors are simply going about their daily business, and not trying to irritate us. All creatures have a role in the local ecology. If we leave them alone, they will usually go on their way. If we are attracting wildlife, even unintentionally, then it is up to us to make the changes to reduce any potential conflicts.

#2: Don’t feed the wildlife. For most wild animals, every day is a struggle to find food. Food put out intentionally or unintentionally by people is a real bonanza for wildlife. But feeding wildlife is problematic in many ways:

- Many of the foods we try to feed animals are not good for them, and can cause health problems including tooth decay. A mammal with a sore mouth will have trouble eating, and may starve.
- Animals learn to associate people with food, and can lose their natural fear of humans. This may lead to them becoming more aggressive in trying to obtain food, resulting in possible injury.
- Attracting some animals to our yards may also attract their predators, or other animals we would rather not share our homes with. For example, feeding birds may also attract rodents, which in turn may attract coyotes or bobcats. Likewise, javelinas are also attracted to bird seed, and mountain lions may follow the javelinas. If you feed birds, keep bird seed out of reach of other animals. Use a platform under the feeder to catch spilled seed.
- Dog and cat food are very attractive to hungry skunks, raccoons, rodents, coyotes, and javelina. Feed your pets inside, make sure there are no leftovers after they finish eating, or make sure no other animals can get to the pet food bowls.
- Garbage attracts bears, raccoons, skunks, and other wildlife. Store your garbage securely where animals cannot get to it. If you have garbage pickup service, don’t place it on the curb until the morning of pickup.
- Fruit trees also attract bears, raccoons, skunks, javelina and other wildlife. Make sure your fruit trees are fenced off, using electric fence if necessary, to keep wildlife out.

Some ornamental shrubs, grasses, flowers, and trees are very attractive to deer, rabbits, and javelina. An electric fence is the most effective means to keep these animals out, but planting vegetation that is less attractive may be a better option. Many native plants can withstand being nibbled on by wildlife. Your local nursery may have suggestions on plants that are not desirable to deer or rabbits.

#3: Don’t keep wildlife as pets. This is illegal in many areas, and requires special permits in other areas. Most wild animals do not make good pets, and are often abandoned as they get older and owners realize they got into more than they could handle. Often these animals lack the skills necessary to find food and avoid predators. They may become dangerous to other people or pets, or may die a slow death from starvation.
LIVING WITH WILDLIFE CONTINUED…

#4: Reduce shelter for nuisance animals. Dense vegetation and debris piles, including brush, old tires, compost bins, and even wood piles provide secure housing for a number of animals. Skunks and opossums in particular are fond of debris piles. These animals seek out a quiet shelter in which to spend the day. If you don’t want these animals around, the simplest thing to do is remove food and shelter. Likewise, holes under houses and sheds are ideal hiding places for pack rats, and skunks. Close off any potential entrances, including vent holes and chimneys (which can attract raccoons) using hardware cloth or wire mesh. If you think the animal may be inside, wait until it has left for the evening, or put up a one-way door which will allow the animal to leave but not return. Do not do this if you suspect baby animals may be present, as it might result in their starvation if their mother cannot return to them. The safest time to close off entrances to potential wildlife is from September to March.

#5: Control and vaccinate your pets. Free roaming cats are estimated to kill hundreds of thousands of birds and small mammals every year. Free roaming dogs are known to kill or maim deer and livestock. Dogs and cats may pick up or spread diseases to wildlife, or may be injured by coyotes, mountain lions, bobcats, bears or javelina. Please keep your house cats inside, and keep your dogs controlled when outdoors. Also make sure your pet’s vaccinations are current, which protects not only your pets, but also the local wildlife. In Santa Cruz County, all dogs must be in pens or on leash if outside.

#6: Relocation is the last resort! Trapping and relocating an animal from your yard may seem like a humane thing to do, but it can be anything but humane. Relocated animals suddenly find themselves in unfamiliar surroundings, and immediately head for home. They no longer know where food, water, and shelter are, and no longer know the safe places to hide from predators. They are much more likely to suffer from dehydration and starvation, or get hit by cars or killed by predators as they try to get home to familiar ground. Mortality rates among translocated animals are very high. In addition, the areas in which the animals are released usually have residents of the same species already living there. Suddenly adding new competitors is stressful for both the residents and the translocated animals. If you absolutely must get rid of the animal, call your local wildlife agency which can recommend a licensed trapper to move the animal.

#7: Never use poison! Rat and mouse poisons are easy to obtain and apply, leading us to believe it’s an easy solution. But poisons cause tremendous suffering not only in the animals we are trying to get rid of, but they are often consumed by other animals, including our pets, which are then exposed to the poisons. A recent study in California found a large number of bobcats and coyotes suffering from poisoning, not directed at them, but at rats in residential areas. There are plenty of other solutions available, so that poisoning is not necessary.
UNWELCOME WILDLIFE

Living with mice in the house, a skunk underneath it and a hungry hawk looking for your favorite tabby cat is not a great deal of fun. Birds will strip the fruit trees, while deer play in the flowerbeds. Meanwhile, cottontails and jackrabbits are feasting on those newly planted shrubs and trees in the front yard. You will spend countless hours listening to “old wives’ tales” on how to combat these problems, and many of these remedies work. Hanging human hair around and urinating on the ground under trees and shrubs has been known to keep the deer away, but you have to keep at it. Rabbits and other garden pests don’t care too much for marigolds so planting a lot of those in the garden helps. Of course, you have to like the smell of marigolds yourself. Keeping the mice out of the house in the fall is a challenge which eludes solution. They can and will get in anywhere. Get a hungry cat, some new traps and a bridle for your temper. Poison bait is not recommended as the mice generally die under the house or under the furniture where they tend to smell bad and are hard to find. Best train your cat to keep an eye peeled for that hawk because it’s against the law to shoot the hawk. Skunks are notorious for invading compost heaps, especially those with ripe table scraps. If a barrier won’t work, you may want to forego the scraps. The good news is that the benefits of rural living far outweigh the petty nuisances of pests. As you live with them, your toleration level rises and your sense of humor takes over. Besides, they were here first!

There are snakes all over Southeastern Arizona. There are a number of poisonous snakes in the desert, but very few deaths occur from snakebites. Most cases are the result of the victim attempting to handle or catch the snake.

Rattlesnakes have a large triangular head and usually have a number of rattles on their tail. If you plan to be outdoors frequently, consult a recent first aid manual to be sure you are up-to-date on the latest techniques for treating bites. Most experts recommend getting to a hospital as quickly as possible. Ice packs, tourniquets, sucking out the venom or drinking alcohol are not recommended.

Bites occur more often in April and May when many hibernating creatures emerge to enjoy the spring weather. By summer the animals have reverted to their nocturnal habits and are less likely to be out the same hours as humans.

A good rule of thumb to follow about snakes is keep a keen eye open for them and avoid them if possible. Never put your hands where you can’t see. Some harmful spiders like those “out of the way” places we tend to stick our hands. The Black Widow and Recluse spiders are the most dangerous, and can be fatal. Tarantulas, once greatly feared, are actually quite harmless, being non-aggressive and less venomous than black widows or recluse spiders. Scorpions, close relatives of spiders, are rarely seen, but do exist in southeastern Arizona. For the most part they are harmless, their sting being no more than that of a bee. Thirteen of the reptile species are venomous and potentially dangerous. One amphibian (River Toad) is poisonous. Arizona has one-third of the entire rattlesnake species found in the world – more than any other state. Many native insects including bees, wasps, ants, and also some spiders have toxins or venoms that are dangerous to humans.

There are 428 wildlife species in Arizona that are listed as protected. Twenty-four of these are on the Federal Endangered Species List. For more information on endangered species, contact the Arizona Game and Fish Department or the U.S. Fish and Wildlife Service.

The Poison Control Center in Phoenix can be reached at (602) 253-334 and in Tucson at (520) 626-6016.
Most of the “bugs” you’ll meet in Arizona are harmless, and actually serve important roles in keeping nature in balance. Arizona's hot, dry, climate frees residents of many of the bug problems you find in humid areas. You'll also find few rodent problems here. There are a few natives, however, that should be approached cautiously and medical help should be sought immediately if you are bitten.

**Lizards**
Common and, for the most part, harmless little creatures, lizards love to sunbathe and climb block walls. The only poisonous species is the Gila monster. It is easily recognizable by its size. About a foot long with a heavy tail and beadlike skin, it is black with shades of orange and pink. If bitten, plunge the area into water to get the Gila monster to loosen its grip, then seek medical attention.

**Black Widows**
Shaped like a globe, this spider is black and shiny with red or orange hourglass-shaped markings on its stomach. Its distinctive, strong, irregular-shaped web makes it easy to identify.

**Brown Recluse Spiders**
Often found hiding in closets, under firewood, and under the sink, this spider is about the size of a nickel or a quarter. It has a violin-shaped mark on the back of its head and chest region and is light tan or brown.

**Scorpions**
Only one of the 15 varieties of scorpions found in Arizona is very dangerous. It is about one and a half inches long and has a nearly transparent exoskeleton with slender pincers, and a slender tail. While about 1,000 scorpion bites are reported each year, deaths from scorpion bites are almost unheard of.

**Mountain Lions**
Though common, mountain lions, also called “cougars”, are rarely seen or encountered by homeowners. However, the potential does exist that you could find one in the neighborhood, especially if you live in an area with a large number of available prey, such as mule deer or livestock. If you suspect that a mountain lion is in the area, use caution. Small pets or livestock are vulnerable to mountain lion attacks and should be secured.

**Common Sense Solutions**
A few simple solutions to some of the more common wildlife damages include encircling small shrubs or trees with a suitable length of chicken or mesh wire to keep wildlife from browsing on them. Wildlife visits to a feed lot can be reduced if the landowner alters feeding times. For instance, if cattle are fed early in the morning and given enough only for one day, very little, if any, feed remains for deer when they visit after dark. Home gardens and orchards can be protected by simply enclosing them in a seven to eight foot high fence that deer cannot jump over.

If you have any questions about wildlife call the Arizona Game and Fish Department in Tucson at (520) 628-5376.
Africanized Honeybees, also called “killer bees” live in Southeastern Arizona as well. They acquired the name “killer bees” because they viciously attack people and animals who unwittingly stray into their territory, often resulting in serious injury or death. It is not necessary to disturb the hive itself to initiate an attack. In fact, Africanized bees have been known to respond viciously to mundane occurrences, including noises or even vibrations from vehicles, equipment and pedestrians. Though their venom is no more potent than native honeybees, Africanized bees attack in far greater numbers and pursue perceived enemies for greater distances. Once disturbed, colonies may remain agitated for 24 hours, attacking people and animals within a range of a quarter mile from the hive.

Africanized bees proliferate because they are less discriminating in their choice of nests than native bees, utilizing a variety of natural and man-made objects, including hollow trees, walls, porches, sheds, attics, utility boxes, garbage containers and abandoned vehicles. They also tend to swarm more often than other honeybees.

“Bee” Prepared

- As the number of Africanized bee colonies increases in an area, so, too, does the likelihood of human and animal encounters with them. Serious human injury can be avoided if the habits of Africanized bees are learned and precautions taken.
- Wear light-colored clothing. Bees tend to attack dark things.
- Bees are sensitive to odors, both pleasant and unpleasant. The smell of newly cut grass has been shown to disturb honeybees. Avoid wearing floral or citrus aftershaves or perfume.
- Check your house and yard at least once a month to see if there are any signs of bees taking up residence. If you do find a swarm or colony, leave it be and keep family and pets away. Find a pest control company or a local beekeeper to solve the problem.
- To help prevent honeybees from building a colony in your house or yard, fill all cracks and crevices in walls with steel wool and caulk. Remove piles of refuse-honeybees will nest in an old soda can or an overturned flowerpot. Fill holes in the ground.

Bee Attacks

- Obviously, it is best to avoid contact with Africanized honeybees. But, if contact becomes unavoidable, it is important to know what to do. Bees target the head. Nearly all those who suffer stinging incidents with Africanized bees are overcome by stings to the head and face. The best method of escaping a bee attack is to cover your head and run for shelter. Try to find shelter as soon as possible. Take refuge in a house, tent or a car with the windows and doors closed.
- DO NOT JUMP INTO WATER! Bees will wait for you to come up for air.
- Once you are away from the bees, evaluate the situation. If you have been stung more than 15 times, or if you are having any symptoms other than local pain and swelling, seek medical attention immediately. If you see someone else being stung or think others are in danger, call 911 immediately.
- Remove stingers as soon as possible to lessen the amount of venom entering the body. Scrape stingers on the skin with a blunt instrument or plastic card. Do not remove bee stingers with fingers or tweezers-this only forces toxins into the victim’s body.

CONTACT YOUR LOCAL EXTERMINATOR FOR BEE REMOVAL!
RABIES IN ARIZONA:

Some populations of mammals in Arizona are vectors for rabies, and in some years, the numbers of human encounters with rabid animals is a serious concern. Bats, skunks, and foxes are the mammals that usually contract and transmit rabies in Arizona, but they may transmit rabies to other mammals, such as bobcats or coyotes which may in turn come into contact with humans. There are at least 3 strains of the rabies virus in Arizona, one or more bat strains, a south-central skunk variant found in all 4 species of skunks, and an Arizona gray fox variant. Rabid bats may be encountered in any part of the state, however rabid skunks and foxes are usually found in the southeastern part of the state, extending up to the Mogollon rim in Central Arizona. For foxes and skunks, rabies tends to be cyclic, that is, in some years the number of rabid animals reported to officials is high, and other years much lower.

Rabies is caused by a virus that attacks the nervous system. It is spread by bites or contact with saliva or nervous tissue (primarily brain or spinal fluid). It is almost always fatal once symptoms appear, anywhere from 1 week to 6 months following exposure. Almost all mammals are susceptible to rabies, although in Arizona, bats, skunks, and gray foxes are the once most commonly infected. Rabies causes a brain infection which results in changes in the animals’ behavior. Nocturnal animals may be seen moving about during the day. Some animals become highly agitated and may become aggressive; others may seem weak and lethargic. If you see an animal behaving unusually, avoid it and call your local animal control office. If you are bitten, seek medical treatment.

Because of its deadly nature, we should always be concerned about rabies in wildlife. However, even during rabies epizootics (when high numbers of rabid animals are reported), only about 5% of animals tested by the Arizona state labs are confirmed with rabies. This is a small proportion of the overall population, and no cause for panic. We can help reduce the threat of rabies in several ways:

- Keep your pet’s vaccinations for rabies current (see your veterinarian for vaccination schedule).
- Discourage wildlife such as foxes and skunks from taking refuge in or near your home, by reducing attractants.
- Avoid translocating wildlife from your home to other areas. If they are sick, they may transmit disease to many other animals as they try to find their way home.
CONTROLLING WEEDS

Weed Control-Especially Non-Native (Exotic) Plants

Noxious weeds are widespread in Southern Arizona, and are a huge problem. Uncontrolled, weeds can ruin pastures, fields, public lands and wildlife habitat. DON'T PLANT A PEST!

Control Methods

Control methods for annual and bi-annual weeds are usually targeted to slow or prevent seed production. Perennial weeds live more than two years and are more difficult to control. Control methods should prevent or reduce vegetative growth as well as prevent seed production.

**Biological** - Release of insects, which feed exclusively on the target weed. Control results are sometimes slow depending on how rapidly insect populations naturally increase. Insect control will usually thin the weed populations, but will not eliminate all weeds. Grazing is sometimes used as a biological control on weeds edible to sheep, goats or cattle.

**Mechanical and Cultural** – Includes mowing, tilling, over seeding and smother crops. Use depends on the kind of weed and locations of infestation.

**Chemical** – Use of contact or residual herbicides. In all pesticide applications, the directions for use on the product label must be strictly followed. Chemical control is not usually compatible with beneficial insects because some weeds need to survive for an insect population to carry over.

The following are some examples of control for some of the more common weed infestations:

**Knapweeds** – Russian knapweed is a severe and widespread problem. Control is difficult, and the most effective method at present is with herbicides. Mowing and tilling to prevent seed production are helpful as is grazing with sheep or goats. Horses should not be allowed to graze Russian knapweed, as it can be toxic and potentially fatal.

**Canada Thistle** – Use herbicides in combination with mowing to prevent new plants from root sprout and seed spread. Some insect control is becoming available that shows promise.

**Musk Thistle** – The key objective is to prevent seed production. Mowing in combination with herbicides is effective. Hand grubbing (hoeing) small infestations is also effective. Several beneficial insects are becoming available which work on the seed head, crown and leaves of the plant. Insects reduce the stand but do not give complete control. Seeds are viable in the soil for several years.

**Leafy Spurge** – Powerful herbicides at present are the most effective means for control. This also applies to Dalmatian and yellow toadflax. Questions on control should be addressed to your county weed program.

Remember! Your weed problem is also your neighbor’s weed problem. Control your weeds and avoid conflicts. Several counties have a weed control program to assist private landowners. Consult your county weed program office, the Cooperative Extension office or other USDA agencies.
## INVASIVE PLANTS PROHIBITED FROM USE IN LANDSCAPING

<table>
<thead>
<tr>
<th>BOTANICAL NAME</th>
<th>COMMON NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ailanthus altissima</td>
<td>Tree of heaven</td>
</tr>
<tr>
<td>Atriplex semibaccata</td>
<td>Australian saltbush</td>
</tr>
<tr>
<td>Cardaria draba</td>
<td>Hoary cress, white top</td>
</tr>
<tr>
<td>Cenchrus ciliaris (Pennisetum ciliaris, P. ciliare)</td>
<td>Buffelgrass, Buffel grass</td>
</tr>
<tr>
<td>Centaurea solstitialis</td>
<td>Yellow star thistle</td>
</tr>
<tr>
<td>Cissus incise (c. trifolieta)</td>
<td>Desert grape ivy</td>
</tr>
<tr>
<td>Cortadoria jubata</td>
<td>Jubatagrass, Andean pampasgrass</td>
</tr>
<tr>
<td>Cortaderia selloana</td>
<td>Pampasgrass</td>
</tr>
<tr>
<td>Dimophotexa sinuta</td>
<td>African daisy, cape marigold</td>
</tr>
<tr>
<td>Eichhornia crassipes</td>
<td>Water Hyacinth</td>
</tr>
<tr>
<td>Eragrostis curvula (E. chloromelas)</td>
<td>Boer lovegrass</td>
</tr>
<tr>
<td>Eragrostis lehmanniana</td>
<td>Lehmann lovegrass</td>
</tr>
<tr>
<td>(E. atherstoni)</td>
<td>Cochise lovegrass</td>
</tr>
<tr>
<td>Eucalyptus microtheca</td>
<td>Tiny capsule eucalyptus</td>
</tr>
<tr>
<td>Eucalyptus poyanthemos</td>
<td>Silver dollar gum</td>
</tr>
<tr>
<td>Eucalyptus rudis</td>
<td>Desert gum</td>
</tr>
<tr>
<td>Eucalyptus spp.</td>
<td>Eucalyptus species</td>
</tr>
<tr>
<td>Hydrilla verticillata</td>
<td>Hydrilla</td>
</tr>
<tr>
<td>Lantana camara</td>
<td>Bush lantana, many cultivars</td>
</tr>
<tr>
<td>Lantana montevidensis</td>
<td>Trailing lantana</td>
</tr>
<tr>
<td>Linaria genistifolia ssp. Dalmatica</td>
<td>Dalmation toadflax</td>
</tr>
<tr>
<td>Lythrum salicaria</td>
<td>Purple loosestrife</td>
</tr>
<tr>
<td>Myriophyllum aquaticum</td>
<td>Parrotfeather</td>
</tr>
<tr>
<td>Nerium oleander</td>
<td>Oleander (many cultivars, varieties)</td>
</tr>
<tr>
<td>Pennisetum setaceum</td>
<td>Fountain grass</td>
</tr>
<tr>
<td>Rubus discolor (R. procerus)</td>
<td>Blackberry, Himalayaberry</td>
</tr>
<tr>
<td>Salvinia molesta</td>
<td>Giant salvinia</td>
</tr>
<tr>
<td>Sorghum halepense</td>
<td>Johnson grass</td>
</tr>
<tr>
<td>Tamarix aphylla</td>
<td>Athel tree tamarisk</td>
</tr>
<tr>
<td>Tamarix spp.</td>
<td>Salt cedars, all species</td>
</tr>
<tr>
<td>Vinca major</td>
<td>Periwinkle</td>
</tr>
<tr>
<td>Zizphus jujuba</td>
<td>Chinese jujube, common jujube</td>
</tr>
</tbody>
</table>

FOR A LIST OF ACCEPTABLE NATIVE PLANTS FOR LANDSCAPING, CONTACT SANTA CRUZ COUNTY EXTENSION OR

www.audubonresearchranch.org/PDFs/PlantList_SantaCruzCountyAZ.pdf
Newcomers to Santa Cruz county should mind the lessons learned elsewhere in the desert Southwest. Many cities are in a water crisis, and even some rural areas lack sufficient water. Every resident must use water carefully and efficiently.

**Landscaping:**
- Before you decide what plants to use, take a walk through the natural areas that most resemble your site.
- Look at what plants thrive and will give your yard the look you want. If you must plant a species that is not native, be certain that it will not naturalize or spread beyond your yard. Invasive plants cause millions of dollars of damage each year to native ecosystems and agricultural fields.
- Be sure the plants you plant close to your house or other buildings are fire resistant. Many plants will burn even if green – conifers are especially dangerous.
- Use water harvesting techniques to minimize your need for supplemental watering by directing rainwater from roofs, patios, and driveways into your landscape.
- Select plants that can survive in local conditions with minimum irrigation. If you install an irrigation system to get your plants started, be sure to wean the plants off gradually – but do wean them off!


**Landscaping for wildlife:** Keep your wildlife friends in mind when you design your landscape. A yard that is safe and inviting to birds and other wildlife can provide endless hours of relaxation and joy for the human inhabitants.
- Plant native species that will provide food, nest sites and shelter. Visit your local nursery and ask for native species.
- Don’t feel you need to remove every dead branch from your trees – snags provide perches and nesting sites.
- Don’t prune dried flower heads, especially in the fall. Leave them to provide seed for the birds.
- Do provide a source of water, but be certain that it is cleaned regularly, and ensure that animals have safe access. They may drown if they can’t get out.
- Don’t use pesticides or herbicides unless ABSOLUTELY necessary. These chemicals can have unintended consequences. For instance, did you know hummingbirds depend on tiny insects as a source of protein and use spider web to build their nests?

Check out websites* of Arizona Native Plant Society, Arizona Game and Fish Department, or Audubon Society for more ideas.
“When will the wind stop blowing?” In parts of Santa Cruz County, the answer is “Between 4 and 7 a.m. – sometimes!” Strong, even gusty winds have shaped the landscape and vegetation of southeastern Arizona for thousands of years, and won’t stop just because we want to build homes here! There are ways you, as a home owner, can cope with the winds. The most effective is simply to site your home where it receives some protection from the prevailing winds. If that isn’t an option, you might consider tree and conservation plantings.

**Choosing Trees and Shrubs:**

Before you buy, you need to find out if the trees or shrubs are appropriate for your area. Take advantage of the abundant references at your local libraries, universities, and nurseries; such agencies as the Natural Resources Conservation Service can give you technical assistance in planning, planting and management techniques.

Other things to take into consideration when planting trees and shrubs are: how big will it get, how long will it live, its leaf color in the fall, any nuts or fruit it may bear, and the proper planting instructions and care for that species.

Make a conscious effort to select trees and shrubs that are native to your area. They will live longer, be more tolerant of local weather and soil conditions, and be more beneficial to wildlife than non-native species. Avoid exotic trees that can invade other areas, crowd out native plants, and harm natural ecosystems. Plant a variety of species. For wildlife, choose trees and shrubs that bloom and bear fruit or nuts at different times of the year.

A well-planned conservation planting combined with three to five years of good management can make the difference between success and disappointment. Items to consider when planning include the objective of the planting, site preparation (plowing or diskig), site characteristics (elevation, aspect, slope, climate, soils, wind direction, building roads and utility right-of-ways), species, spacing, water availability, livestock and wildlife protection, weed control, and protection from wind or sun.

For a successful planting, you will have to irrigate your newly planted trees and shrubs for several years. Be certain that your water system is up to the task.

**Vegetable Gardens:** There’s not much that can compare with the taste of a tomato, fresh from your garden. There are some challenges to gardening in Santa Cruz County, but whether you raise a single tomato plant in a pot on your patio, or plant enough vegetables to carry you through the winter – the result is worth the effort (most of the time!). Your County Extension Service has a wealth of information, and there are many excellent books on the subject, check out the resource directory in this booklet. Here are just a few tips for gardening in Santa Cruz County:

- Learn to work with the weather, and to accept that no two years are alike. We’ve had frosts as late as mid-May, and as early as mid-September, so the growing season may only be 120 days long.
- Water is precious! Monsoon precipitation may not arrive until July, so be prepared to irrigate. Conserve water by mulching, using a drip system, and planting vegetables that can stand some droughty conditions.
- Be sure your water supply will be sufficient – once a well is pumped dry, it may not recover.
- Soil is a key element to a successful garden. In general, the layer of topsoil is thin and usually fairly alkaline with low organic matter. Caliche (calcium carbonate) may form a thick, impervious layer below the surface that must be broken before proper drainage takes place.
- Santa Cruz County has a generous supply of organic fertilizer. Ask your neighboring rancher if you can clean his/her barn for the manure. You might want to compost it for a year or two before you use it, but manure adds nutrients to the soil along with organic matter.
VEGETABLE GARDENS CONTINUED...

- Shade may extend your growing season through the hottest days, but remember – the winds out here are strong and gusty. Make certain that your shade structure can take the breezes, or you might find it in the nearest tree.
- Insects are a fact of life. Some years the grasshoppers or other plant-eating insects win. Better luck next year. Not all insects are bad for your garden. Bees, moths, and flies all are excellent pollinators, and butterflies are just plain beautiful. Indiscriminate use of pesticides can harm insects that are working for you.
- Along with the insects, add rabbits, deer, javalina, cotton rats and a whole host of other native wildlife that are happy to chow down on your vegetables. A fence is almost mandatory, but even then – you’re going to lose some vegetables to the critters. Best solution is to overplant so you have enough to share.
- Talk to folks in your neighborhood who are successful gardeners. They’re the experts about what will work in the particular area that you call home.

SMALL-SCALE FOOD PRODUCTION AND COMMUNITY GARDENS

By Kate Tirion

Food production does not always occur on a large scale. Household and community gardens throughout Santa Cruz County are great opportunities for people to come together and enjoy the benefits of locally grown produce. The Patagonia Community Garden is one example:

Inspired by the vision of a sustainable community, the Patagonia Community Garden project began with the co-operation of the Town, a handful of committed volunteers and a donation of $500.00.

Almost nine years later this 2/3 acre site is home to a small orchard, already producing. In the heat of summer, eighteen varieties of heirloom apples, plums and pears, cast shade on the waffle-pattern of growing beds that harvest rainwater and grow organic food in the rich, dark soils of this former cienega. Grapes and roses trail over fences in a tangle of beans and tomatoes, in easy reach of passers by. They punctuate the long sentence of flowering borders, jeweled with hummingbirds and butterflies, and the promise of pomegranates.

If you were to visit, you would find yourself on a meandering path, wide enough for two, edged with iris and deep blue summer larkspur, your senses scented. Benches would invite you to sit awhile, perhaps in a rosy bower, beneath a shady arch, or under a plum tree in the contemplative garden, where soft-spilling water soothes the soul. There is time here to pause and remember what is meaningful, time for a picnic around the historic CCC-built table, shadowed by a gnarled old cottonwood.

You might hear the laughter of the 4H children growing knowledge and healthy ways as they work their plots, sampling crops; you may witness a father teaching his daughter what his father taught him, and his pride in her understanding.

Like the Town itself, this is a gathering place where community is fostered through time-honored ways of cultivating food, friendship and knowledge. Today we take pride in knowing that dozens of our children know soil processes and how to grow food. We, at the Community Garden, can think of no better way than to empower them to use their hands.

There are also seasonal Farmer’s Markets in Nogales, Patagonia, and Sonoita. These are great opportunities to experience and support local and garden-grown foods, and engage with the community.
There are about 100,000 acres of irrigated farmland in SE Arizona. Irrigation water is expensive and must be applied efficiently. Ground water can be at depths of anywhere from 100 to 700 feet. Pumping costs are high, $20,000 is an average cost to run a 120 acre pivot with alfalfa. Drip irrigation and center pivot sprinklers are generally the most efficient way to irrigate crops. Surface water supplies are highly variable depending on snow pack and rainfall. Before anyone decides to go into farming, they should be encouraged to visit with local farmers and government agencies charged with the conservation of our resources.

The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) is working through the Arizona Association of Conservation Districts (AACD) and the local Natural Resource Conservation Districts (NRCD's) to bring the resources of USDA to the region. They can assist with advice and financial assistance to agricultural producers and landowners. For further information please contact your local USDA Service Center.

**Alternative Crops**

The following cash crops were identified by the University of Arizona College of Agriculture as having potential in Arizona. Only crops that grow well at higher elevations (3,000 to 4,500 feet) are included:

- Peanuts
- Blackberries
- Pomegranates
- Fourwing Saltbush
- Kenaf

- Pears
- Raspberries
- Bladder Pods
- Grain Amaranth
- Medicinal Plants

- Soybeans
- Sunflowers
- Buffalo Gourds
- Pyrethrum
- Pecans

- Strawberries
- Almonds
- Crambe
- Quince
- Quinoa

- Sweet Cherries
- Jojoba
- Guayule
- Quinoa
Production of horticultural crops, i.e. fruits and vegetables, is a highly technical interplay of science, art, hard work and salesmanship. The science of production can be learned from many information sources but the art of production comes only with experience. The hard work begins during planning in the winter months and continues through planting, cultivation, pest control, harvest and marketing. Production of a crop is only half the battle. The ability to sell the crop at prices that will return a profit requires as much skill and hard work as growing the product. The "glamour" of living on the land fades quite fast as a grower has a mature crop and no home for it. It must be remembered that perishable produce is consumed or spoiled in days to weeks after it is harvested.

Successful farming requires initiative, experience, favorable weather, imagination, management, timing, hard work and sometimes plain luck! Before getting started in large scale production, ask yourself the following questions:

**Question**

1. Do you grow a vegetable garden and keep it weed free?

2. Do you grow enough fruit and vegetables to can and freeze or would you rather buy produce in the off-season?

3. Do you keep records on personal income, monthly bills and expenses or detailed production records?

4. Do you have additional family members to work on the farm?

5. Do you have adequate savings or off-farm income to cover cash expenses while growing fruits and vegetables?

6. Can you afford a net income loss for the first 3 to 5 years?

7. Have you developed a 5 or 10 year long-range plan and goals that are written down?

8. Do you consider farming a lifestyle or a business?

**Answer**

A positive response does not guarantee success, but a negative answer indicates you may not be interested in the tiresome but critical aspect of growing vegetables - weed control.

People who spend the additional time to can and freeze may be more self reliant and willing to work the extra hours required to be successful.

Precise and continuous record keeping is critical to success. Today's grower can't wait until tax time to find out if any money was made.

Net profits after labor cost may be small. Perhaps you're better off employing family members rather than hired labor. Evaluate your own situation.

Cash flow is critical on the farm as most expenses are incurred during the spring and payment may not be made for several months after harvest.

Experience is expensive and it may take several years to learn to grow and market successfully.

Have a carefully planned goal. It helps get you through the tough times.

It better be both if you expect to be successful.
It is difficult to define all the personal and financial characteristics of any individual that lead to success. However, if any one attribute were to be identified, it would be management ability. Fruit and vegetable farmers must have the ability to juggle several activities at once. These include planting, cultural care, irrigation, pest control and harvest of several different crops at once while doing so in a timely manner. Managing labor and pleasing customers is another aspect that must be done as well as record keeping of finances and crop production. Growing produce crops requires daily observation of the crop and making decisions in a timely and appropriate manner. The other half of the job is selling your products for a profit so you can plant and produce next year.

**Production Planning**

One of the most commonly asked questions is "What should I grow?" The answer is quite simple, "Grow what you can sell." Generally marketing will direct production. However, determining what and how much of each crop that will sell is very difficult.

Two distinct and inclusive categories of markets are available for the sale of vegetables and fruits. These are: 1) fresh produce markets, which usually provide higher returns per unit but require high and consistent quality (Large markets such as grocery and restaurant chains require large quantities which small growers can not usually satisfy), and 2) processors, who provide a steadier market which is less subject to daily price changes which are caused by over or under production. They can also handle large quantities of product and usually have contracts with growers to harvest at certain time intervals to keep their processing facilities operating over a long period of time.

If you want to sell to chain stores and restaurants, you may need to pool your products with other growers and sell through a shipper/broker. In that case your returns will only be about 15 to 25 percent of retail prices.

Most new growers of produce are usually better off trying some type of test marketing or direct marketing on a small scale before committing to a specific strategy. Options include, but are not limited to, pick-your-own (PYO), roadside stands, farmers’ markets, or mail order marketing. However, there are barriers to market entry. For example, if a farmers’ market does not exist, it can be very difficult getting one established. Or if your location is poor, perhaps a roadside stand may not have the traffic volume to support it. Risk assessment must be done on any new marketing strategy. (See section on risk assessment).

New growers are encouraged to visit existing operations and talk to the owners. Also speak with local restaurant and grocery store owners. Generally they would prefer to buy high quality, home-grown products. A potential buyer wants not only to know you have a desire to supply quality products, but that you have the ability and can deliver. The first few years will be critical as you seek to gain a reputation as a reliable producer of quality products.

Established markets may take rather large quantities of produce if demand is high. You must plan for this. Some vegetables, such as sweet corn, tomatoes, snap beans and melons are usually pre-picked for sale at PYO operations. The reason is that the general public can not judge crop maturity by appearance or feel. Succession planting is imperative to meet the market demands through the growing season. Other crops that can be sold as pre-picked or PYO products include bell and chili peppers, eggplant, carrots, potatoes, beets, turnips, cucumbers, cabbage, broccoli, parsley, pumpkins and various summer and winter squashes. If you have in your marketing area people from different regions of the country or ethnic groups, grow products that they enjoyed in their native areas. For examples people from the southern United States enjoy okra, black-eyed peas, collards, turnip and mustard greens. People from Asia enjoy bok-choy, daikon radish, and various greens. However, these can have limited appeal, so beware of over production for local markets.
Production of fruits can be very rewarding. Tree fruits and nuts like apples, pears, peaches, apricots, cherries, plums, citrus, pistachios, pecans and walnuts require a commitment for 20 to 30 years or longer. Spring frost problems can decrease production or wipe it out for the entire year. However, the trees still will need capital investment and labor to keep them growing for next year's crop. Labor for harvest can be great and pick-your-own marketing will reduce harvest costs; however, many orchards that have plantings of 20 to 30 acres generally sell only 10 to 20% of their crop to PYO costumers. The large majority are sold already picked in bags and boxes to commercial customers. This necessitates a packing line which is a major capital investment. Small fruits like grapes, strawberries, raspberries, blackberries, currents and gooseberries will produce marketable crops in the 3rd or 4th year. Production can last from 4 to 8 years in the case of strawberries and brambles and many, many years for other small fruits. For example some grapes will be productive for 50 to 75 years. Small fruits are labor intensive when it comes to harvest and lend themselves well to pick-your-own operations. These fruit plants are shorter lived than tree fruits and therefore more easily changed over to other crops.

In addition to markets, the decision on what to grow will be determined by how much labor, land, equipment and capital you have available. Many vegetables present potentially high returns but also require high capital investment. Generally, the higher the return on a crop the higher the risk. For example sweet corn is relatively easy to produce and market locally; however, the return will be much less than for bell peppers or broccoli, which are more difficult to grow and sell. Also low labor requiring crops might be preferred unless family members are available to work. Sweet corn requires less labor than crops like tomatoes or cucumbers which are picked throughout the season and lend themselves to PYO operations.

Markets not only influence what and how much you choose to grow, but also how it is grown. For example, a pick-your-own market might dictate that a grower produce pole tomatoes or pole beans that can be productive throughout the season rather than bush type varieties which will produce for a short period of time and then be tilled under and replanted. Early producing varieties will capture the early market which is usually more lucrative and withstands poor quality better than a mid-season market.

Once the appropriate marketing plan and list of potential crops have been developed, the production potential of these crops in the producer's operation should be determined. Producers should consider four areas when evaluating the production potential for fruit and vegetable crops. These are: production resources, cost assessment, risk assessment and operation evaluation.

Production guides, budgets and recommendations can be obtained from the University of Arizona Cooperative Extension.

http://cals.arizona.edu/extension
Production Resources

Important production resources to consider are land, water, labor, capital, management and machinery. There is a great variance in soil types and weather patterns, even in a relatively small area, and must be considered when selecting fruit or vegetable crops for production. When evaluating land and water resources, producers need to consider soil types, topography, wind control, previous cropping history of the site, irrigation system and length of growing season.

The soil type will influence the crop selection process. Some crops can be grown in a wide variety of soils while others need specific soil types. Topography affects the length of the growing season and air and water drainage, light intensity and field erosion. Wind can severely damage fruit and vegetable crops, especially crop stand and quality.

Previous crop production can be critical to the success of a fruit or vegetable enterprise. A previous crop on the same field can influence the type of pests and problems that the crop will experience. Also, it is important to know the history of the field regarding what pesticides and herbicides have been used on the site and what, if any, carryover of chemical residues exists.

In order to produce most fruit and vegetable crops, an irrigation system is needed. Producers can use ground or surface water with various irrigation technologies, (flood, furrow, sprinkler, drip) depending on soil types, topography, labor and available capital. Also, irrigation districts and local, county and state laws may dictate when, how and where you irrigate.

In some cases the short growing season of many vegetable crops allows producers to double and even triple crop plots of land. Several advantages of multi-cropping are that low prices or crop failure may not result in a total loss for the season. It may be possible to keep labor employed for longer periods, thus increasing the chances of having labor when needed. Some crop rotations may decrease the chance of pest buildup and lessen fertility loss. Low pre-harvest capital requirement crops may be used to provide cash for high pre-harvest capital requirement crops. The ability to sell more than one product generates repeat consumers, and allows marketing over a longer season. Some disadvantages of multi-cropping are: more management skill and knowledge about each crop’s culture is required; labor and harvest scheduling may become more challenging if planting and harvest overlap for different crops; the days to harvest will decrease or increase as temperatures increase or decrease for the same crop; the number of pest problems may increase; and field and harvesting equipment needs may conflict and require more capital investment for the purchase of more equipment. Many of the before mentioned advantages and disadvantages also exist for normal diversification among fruit and vegetable producers growing crops simultaneously on different pieces of land.

Operation size and crops to be produced dictate the amount of labor required. Producers should consider when, how much and what type of labor is needed. The timing of labor requirements depends on the crop and its growth pattern. Some crops are more labor intensive during the growing season, while others require more labor at harvest. Labor can come from various sources - family members, area students, local people, unemployment offices, migrant labor or, in the case of PYO farms, harvest labor from your customers. No matter what the labor source, producers need to check the laws and regulations regarding hired labor.

Since some tasks will be regarded as difficult by laborers and labor might not be available, producers should consider using machine energy instead of human energy if possible and financially feasible. Machinery can increase the investment costs but decrease the operating costs of the operation. Some examples of harvest equipment are bean pickers and sweet corn pickers.
In starting most enterprises, capital is an important consideration. The amount of capital required, rate of interest, opportunity costs and availability are all very important areas of consideration. Capital resources of other current enterprises should be considered as well as off-farm income and/or some type of commercial financing. Costs of capital are affected by attitudes of lenders toward new enterprises, the amount of risk involved and interest rates.

Producers should consider crop capital requirements and their own capital constraints carefully when selecting fruit and vegetable crops. Establishment of most fruit and vegetables requires large amounts of capital. For example, fruit trees, small fruits and asparagus require substantial amounts of capital with little or no income for 3 to 5 years. Tomatoes require large amounts of labor if they are staked and tied before they are harvested.

**Management**

Management is an essential part of fruit and vegetable operations. Producers need to consider their management skills when starting any new enterprise. Evaluations should be made of how much experience they have growing fruits and vegetables and other crops that have similar cultural requirements. Also, they should consider if assistance is available to them when problems arise and if they are willing to seek that assistance when needed. Commercial fruit and vegetable production requires different growing practices and skills than home gardening. Most horticultural crops require daily observation by the manager in order to control pests and manage other potential problems. For example the saying, "If you can see the weeds from your truck in a field, it is past time to control them" is true. It is much easier to control small weed seedlings than large mature weed plants. Producers with little experience who are not willing to seek and use outside information resources substantially reduce the likelihood of being successful with fruit and vegetable enterprises.

Producers need to evaluate the machinery they own and determine if it is suitable for fruit and vegetable production. Can the machinery currently owned be converted for the new enterprise? How expensive is new or used machinery and is it available? Are custom operators available for hire at affordable rates for special operations? Generally fruit and vegetable operations do not require large tractors and implements for cultivation and other cultural practices.

**Cost Assessment**

After resources have been evaluated and particular enterprises chosen for further considerations, expected cost for the operations should be considered. Before a new crop or crop mix is placed into production, producers should estimate as completely as possible all costs associated with such production. Direct costs of operation can be estimated based on input requirements and costs. Some new crops require the purchase of costly new equipment or irrigation systems and the location of new sources of labor and other inputs. Equipment costs should be amortized. Special costs should be accounted for that are associated with different sources of input. Also, the amount of income normally received for other uses from the acreage allotted to the new crop should be in the cost estimates. For instance, if the fruit/vegetable production site is currently used for wheat production, producers should also consider the amount of net income that would have been generated from the wheat, (opportunity costs), as an additional expense for the new enterprise.

Producers should consider labor and irrigation requirements and their associated costs very closely. Depending on operation size, labor may be a very significant expense. Some crops will require a great deal more labor at planting and harvest than at other times during the production process.
Cost Assessment Continued...

Comparative cost estimates can be useful to evaluate irrigation systems, labor, equipment and other production inputs. Producers can create different input cost scenarios for their various options and select the most efficient. Cooperative Extension service can provide useful information to perform cost analyses using crop budgets.

Risk Assessment

After market and farm management decisions have been made, producers should look at the risk involved with each of the enterprises considered. Risk is said to exist when the outcome of an activity is not certain. From the probabilities or estimated probabilities of potential outcomes for an activity, the level of risk associated with that activity can be estimated. Fruit and vegetable producers should be concerned with the probability of disastrously low or negative returns. A small probability of a loss, sufficient to financially destroy a producer, may be “too big a gamble to take”. Each producer should evaluate such “gambles” in light of his/her own financial strength and willingness to take risk.

Operation Evaluation

After each year of production, it is important for producers to evaluate their operation. Record keeping done throughout the production period is very useful in the evaluation process. Records should be financial and operational in nature. Financial records should include start-up expense, capital equipment list, cash flow statements, balance sheets and income statements. Operation records should include day-to-day operations and production practices such as when, where and what varieties were planted, fertilizer inputs, pesticides and herbicides used and rates, date and method of spraying, irrigation times and amounts, harvest dates and labor requirements. Also during the year write down notes of ideas that come or ways to improve production. You will not remember many thoughts you had yesterday if they were not written down. These records help producers locate problems or potential weaknesses that should be addressed and where inputs should be increased or decreased. Tracking specific products for a week, or randomly during the marketing season will provide a snapshot of the value of specific products in your marketing program. The evaluation process also helps growers isolate areas of production and management where they need to learn more. Continuous learning and a sound record keeping system are critical to the success of fruit and vegetable operations.

Special Considerations

Fruit and vegetable production is very different from the extensive type of agronomic crops that are grown on large acreage. One acre of vegetables is about equivalent to many acres of agronomic crops in terms of capital inputs and management. For example the management time and capital inputs needed to grow and market one acre of quality sweet corn is roughly equivalent to 50 acres of field corn because of insect presence and harvest costs. Or the harvest of one acre of zucchini through the growing season is equivalent to 100 acres of cotton or wheat because the acre of summer squash must be harvested several times a week for several months.

Producers’ Expectations

Farmers should realize that fruit and vegetable crops are not the salvation they are seeking if they are in financial distress. If producers have extreme debt problems and have overextended their credit, fruit and vegetable crops will not clear their debts away. Fruit and vegetable crops can help increase producers’ incomes but only with a very high level of management and a fairly high degree of risk. Some studies by universities and experiment stations show potentially high returns per acre. It should be remembered that such information is based on small, intensively managed plots which at times are smaller in scale than a good-sized family garden.
Planning
Producers should make detailed plans of new enterprises well before planting. Market alternatives should be identified and evaluated; field layout and production resources should be planned. All potential crop options should be evaluated in light of particular objectives and resource limitations (land, labor, capital and management).

Knowledge
Producers should objectively evaluate their own abilities, constraints and knowledge relative to growing fruits and vegetables. If they need management assistance and/or information, the availability and accessibility of such sources should be considered. The growers’ willingness to seek out information and assistance should be evaluated. Many books and magazines are available on topics necessary to produce and market quality products. Seminars, conferences, short courses and grower organizations are great places to gather information--both from presentations and others who are involved in the same business.

Self education and knowledge can be gained by doing small experimental plantings of promising varieties or potential cultural practices. This will enable the grower to see if they are as good in the field as the normal varieties or cultural practices without the cost in terms of time and money of a large planting. Cooperative Extension, Experimental Station, Land Grant University and industry personnel can assist growers with on-farm trials.
RAISING LIVESTOCK

One of the attractions of owning rural land in southeastern Arizona is to raise livestock for various reasons. However, because of the low and erratic rainfall in this area the amount of land required to raise livestock on rangeland or dry land pasture limits the possibility of livestock production on smaller tracts of land. Without irrigation, about 40-100 acres are required to pasture one cow or horse (or about 5-7 goats or sheep) for a year.

Irrigated Pastures

To raise livestock on irrigated pasture, the first requirement is obviously to have an adequate supply of water with which to irrigate. A rule of thumb is that a well must produce about 10 gallons per minute for each acre to be irrigated, although that will vary depending on the intensity of management to be applied. Rates of application will range up to about 3 acre feet per acre per year, i.e. enough water to cover each acre to a depth of 3 feet if all applied at one time.

The following are practices recommended for irrigated pasture:

1. Decide whether you want pasture for year-round, winter, or summer use. Some forage plants, e.g. Bermuda grass, grow mainly in the summer period (May-October). Others grow mainly in the cooler parts of the year, i.e. fescue or ryegrass. Alfalfa grows mainly in the summer, but will provide some grazing through the winter, although growth rates at this time of year are very slow. It is possible to “double-crop” by planting winter pasture in the fall and summer pasture in the spring. The plant species to plant will depend also on the soil type, the type of animal to be grazed, elevation (which affect minimum and maximum temperatures), and soil type.

2. Design irrigation systems and fencing to allow pasture rotation. Pasture rotation is important on irrigated pasture for several reasons. First, rotating grazing through several pastures allows control of the timing of grazing which results in greater production from the pasture. Rotation grazing allows forage to be harvested by the animals in a fairly uniform way, then the pasture gets a chance to rest and re-grow before the next grazing. Not only will the pasture maintain vigorous plants that produce more in this way, but the livestock will also harvest the forage more efficiently due to better distribution of use. On irrigated pasture it is usually desirable to limit grazing periods to about a week or 10 days and provide rest periods of at least 3-4 weeks. The second main reason for rotating grazing is to avoid having grazing animals on wet, muddy ground, i.e. keep the animals in a different pasture from that being irrigated. This avoids trampling and compaction of the soil, reducing the ability of the soil to hold moisture and damage to the plants, reducing productivity. Keeping animals off wet ground may also contribute to better animal health.
3. Manage weeds and soil fertility. Weeds are often a problem on irrigated ground. These are the plants the animals don’t eat, so they increase in the pasture and compete with the forage plants. Some of them may actually be poisonous. A properly grazed pasture will usually have fewer weeds than one that is overgrazed. But, even on well-managed pastures it may be necessary to control weeds periodically using herbicides, plowing, mowing, or grubbing. Maintaining good soil fertility is also important. Manure or chemical fertilizers will often provide great increases in the production and/or quality of forage.

4. Balance the stocking rate with the forage production. A general rule of thumb for irrigated pasture is about 1-2 cows or horses (5-10 sheep or goats) to the acre during the high production season. Obviously, since pasture growth rates vary during the year, the number of animals that can be carried will also vary. Grass that is grazed too short will not produce as much as grass that is allowed to make several inches of growth before grazing, and is then grazed to a conservative level (about 4 inches in height).

**Rangeland Pastures**

Commercial production of livestock on rangeland requires hundreds or thousands of acres of land, i.e. a ranch. Recommendations for commercial cattle or sheep ranches are beyond the scope of this booklet. However, some people have small tracts (10-100 acres) of rangeland and wish to run livestock on these. It is possible to do this only to a limited extent. Some of the worst examples of overgrazed rangelands are found on these small tracts. As previously stated, it requires from 40 to 100 acres to support a cow or horse for a year. Animals should not be grazed on a rangeland pasture if more than half of the palatable forage has been consumed. Leaving animals in the pasture and feeding them hay or grain will result in total destruction of the vegetation in the pasture, leading to soil erosion and loss of wildlife habitat. It may also lead to sickness and/or death of the livestock because they may consume poisonous plants.

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**SPECIAL ZONING APPROVAL FROM COUNTY REQUIRED FOR LIVESTOCK**

Even if you have the right size parcel (minimum of three acres) **you cannot have livestock (chickens, goats, horses, cows, etc.) without a special zoning approval from the County.** People planning on having any sort of livestock, should check with the Planning and Zoning Department before acquiring the animals.

http://www.co.santa-cruz.az.us/com_development/planning.html
**Cattle**

Becoming a rancher requires capital, land and knowledge. Although this guide focuses on small acreage, some aspects of ranching are highlighted here to give you a better understanding of a major agricultural enterprise of the area. A cattle producer is ultimately harvesting grass and not just producing pounds of beef. For small acreage landowners, producing a freezer beef every year or a 4-H steer appears to be the only feasible cattle production option. Larger scale production requires sizable, dependable grazing acreage and more complex management. Without progressive knowledge and management, you may become no more than a low-paid cowboy.

Southeast Arizona has a long and rich history of cattle production. Its intermountain valleys and mountain ranges are well suited for range cattle. Winter temperatures are mild. Most grazing occurs on sites comprised of a mixture of grasses, annual and perennial forbs, shrubs and trees.

Most ranches consist of an amount of deeded land along with leased federal and/or state land. These leased grazing lands are an integral part of ranching enterprise and usually change hands only when the deeded ranch property is sold or leased. Most ranching enterprises in the county are cow/calf operations. While calves are born year-round, most are born in the late winter and throughout the spring. Most cattle are sold as weaned calves or as yearlings.

There is no one best breed of cattle to buy. However, it is necessary to match the cattle type with the environment. While no exacting research supports what breeds are ideal, it does indicate that moderate weight cattle (1,000 to 1,200 pound mature cows) are the most economical in the higher elevations, and lower weights of 800 to 1,100 pounds are best in the drier regions of Southeastern Arizona. Crossbred animals are generally superior over straight-bred herds for commercial cows, because they usually produce a calf that is 5-15 percent heavier at weaning time.
A Typical Grazing Rotation

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LIVESTOCK HEALTH

Ranchers are very concerned with the health and well being of their livestock. Nearly all calves in Arizona are vaccinated at the same time they are branded to help prevent disease. Good livestock managers also control of flies, lice and ticks, and many other internal and external parasites of their animals.

Castrating bull calves is done to improve the quality of the meat. Only the best bull calves are selected to become breeding bulls.

Dehorning calves helps prevent serious injuries which cattle sometimes inflict on each other with their long sharp horns. Many cows in Arizona are not dehorned so they can protect themselves and their offspring from predators.

When calves are old enough to live without their mothers’ milk (usually about 6 months old), they are separated from their mothers. This is called weaning. This is a very stressful time for calves, and they must be watched and handled carefully.

THE BRAND INSPECTOR

In Arizona, anyone may acquire a brand through the Arizona Department of Agriculture, but it is not mandatory unless the livestock are turned out on the range. (Any tract of land, public or private larger than 10 acres.) A registered Arizona brand is the best evidence of ownership. However, unbranded animals kept in close confinement may only have a previous inspection. A Brand Inspection is required anytime livestock is transported, purchased slaughtered or sold in the state of Arizona.

A Brand Inspection identifies each specific animal by sex, breed, age and permanent marks such as brands and earmarks. Many livestock owners use earmarks as a means of identification from a distance. (See earmarking & brand chart on next page.) Through very visible from a distance, dewlaps and wattles are seldom used in Southeast Arizona because of the danger of flies that cause screwworms.

Employees of the Arizona Department of Agriculture are charged with protecting the Arizona livestock industry. They must certify that the shipper or seller is the legal owner prior to issuing a certificate of inspection. All lost, missing, strayed and stolen livestock fall under the jurisdiction of the Arizona Department of Agriculture Animal Health and Welfare Program.
Items to Remember:

- Inspection is required for sale or movement even if the previous parties did not comply the last time the animal was sold or transported.
- Inspection is required regardless of whether or not the animal is branded in order to sell or slaughter.
- Inspection is required on horses, cattle, mules and donkeys, and sheep.
- There are self-inspection programs for sheep and cattle.
- Registration papers or lack of registry does not exempt inspection.
- The definition of a brand is a permanent mark on the hide of an animal registered with any state as a livestock brand. Tattoos are not brands.
- Inspection is required at the point of origin unless released by the local inspector/officer.
- Inspection is required when livestock is to be transported out of county. For horses, you may obtain a permanent ownership/hauling card.
- Inspection is required every time livestock leave the state, regardless of circumstances.
- For horses, you may obtain a permanent hauling card (commonly known as the Yellow Card). This is optional as of 2002. In order to obtain a “Yellow Card”, you must have a current health certificate and a bill of sale. Registration papers are not a legal proof of ownership.
- For horses to enter other states they need to have a current health certification (good for 30 days) and most states require a coggins test as well (good for 1 year). Your local vet will be able to do both and it will take 3 to 6 days to get the results back.

For more information, or when in doubt, contact your local Animal Health & Welfare Inspector or Officer or the Arizona Department of Agriculture at 1-800-294-0305.
Goats

Meat goats have potential on the ranges of Southeastern Arizona. Meat goats have a high reproductive rate, kidding three times over a two-year period. The Boer goat of South Africa is a larger, long-legged goat, with a mature height of 26-32” and weight of 100-155 pounds. Meat goats can be stocked with cattle if some browse is available. Goats can provide a viable alternative to chemical brush and weed control. Boer goats are now being raised in Cochise County in cooperation with the Forest Service as a tool for range improvement and noxious weed control.

Buy two because goats like companionship. Goats may be tethered or pastured. Use a five-foot tall stock fence or electric fence. Goats love to perch on high places so satisfy this urge by including rocks or outcroppings within the pasture. Shade is always a necessity in Southeast Arizona.

Goats should be fed alfalfa hay and can also graze small pastures of native vegetation. If contained, remember goats are browsers and like weeds and brush. They need a good 14 to 16 percent dairy grain ration and good quality hay. A goat typically produces 3 to 4 quarts of milk a day. Goat’s milk is famous for its digestibility and, when properly cared for, is virtually indistinguishable from cow’s milk. As with all dairy animals, it is necessary to breed females once a year to obtain milk.

Fences need to be goat proof. The best fences are woven wire. A dog living with the herd is beneficial for predator control.

Sheep

Sheep are pastured and supplemented with hay. The products are wool and meat. Special sheep wire fencing is needed on pastures to control sheep. Barbed wire will not hold sheep. Sheep are easy targets for carnivores, and producers can sustain heavy losses without adequate protection. Of the local predators, coyotes, mountain lion, and domestic dogs are the largest problem. Methods of predator control include using llamas or guard dogs to protect the flock. Sheep are great for noxious weed control, but do need a source of shade available to them.
Horses

Horses are a great way to enjoy Santa Cruz County, and the wide open grasslands of southeastern Arizona have attracted many residents who love to ride. If you are new to the area, here are some tips that horse owners should know:

♦ If you intend to pasture your animals, plan on at least 40 acres per head, with significant supplemental feeding. If you overgraze your land, it may take decades to recover. If you have less than 40 acres per head, plan to corral your stock on a small portion of your property unless you want the entire acreage to assume the appearance of a dust bowl.
♦ The growing season in Santa Cruz County usually doesn’t start until after the monsoons (July) and stops at first frost. If possible, corral your stock during this time to allow the perennial grasses to flower and set seed.
♦ If your horse will be stabled or kept in a corral, you will have to find ways to dispose of the fecal material so that waterways are not polluted and insects aren’t a problem.
♦ Water must be constantly available to penned horses. A horse may drink between 10-15 gallons of water per day, and deprivation may be lethal. If you use a large trough to water your horse, understand that this source of water will draw wildlife. Ensure that troughs have escape ramps so wildlife don’t drown.
♦ Shade from the hot summer sun is essential. If there are trees in your horse pen you should protect the trunks so the horses don’t strip the bark.
♦ Unless you have sufficient acreage, you will need to supplement with hay preferably weed free. Second cutting alfalfa hay has sufficient protein so additional supplements may not be necessary for animals that are ridden lightly. Bermuda grass hay is lower in protein, so supplements may be necessary. Bermuda hay may also contain seeds that may make using horse manure undesirable as compost in gardens. Blister beetle infestations in some parts of southeastern Arizona cause problems with locally grown hay. One dead beetle can kill your horse. Be careful.
♦ Several species of rattlesnake are found in Santa Cruz County. Be very careful.
Old paint, used oil, antifreeze, insecticides, pesticides, and herbicides tend to collect on shelves in sheds, barns and basements. We read regularly about people (children especially) who run afoul of these compounds. The best advice is to get rid of them after you have used them, and do it according to the directions on the label. Most antifreeze is poison – yet has an attractive taste that has killed many pets, and probably wildlife too. Dispose of waste antifreeze promptly and carefully by treating it as a hazardous material.

Call the County Waste Management Department to find out about annual “turn in” days to dispose of pesticides and other household hazardous substances.

Do we need to say anything about firearms? People who move to the country sometimes think that they can turn the pasture into a firing range. Rural areas are getting more congested all the time, and so plinking that tomato can in the back yard may not be a good idea.

Knowing where your neighbor is, and knowing where his cow and your horse are, is a good idea. Stray bullets tend to be non-discriminatory. NEVER shoot close to or toward houses! Remember when you fire shots in the air for any reason, they may be lethal when they come down.

Outdoor Electrical Safety—Electrical accidents and fires kill more than a thousand people and injure tens of thousands of people each year. The following tips are from Tucson Electric Power (TEP) to help you stay safe around overhead electric lines:

- **Look up and look out for overhead power lines.** Be sure you’re aware of any nearby or low hanging lines before you climb a ladder or use a long handled pole.

- **Keep materials, tools and all parts of your body at least 15 feet away from any overhead power lines** at all times, including during the installation of antennas or satellite dishes. If you plan get any closer, state law requires you to make arrangements with TEP – at your expense – that will allow your work to proceed safely. **Call 811 or Arizona Blue Stake at 1-800-STAKE-IT (1-800-782-5348)** to make these arrangements.

- **Never fly kites or model airplanes near power lines or radio or TV antennas.** If your kite does get tangled with overhead lines, don’t try to get it down yourself. Have a parent call TEP for assistance. Never use any metallic material in your kite.

- **Before you trim tree limbs and shrubs, watch out for power lines that could be hidden by foliage.** Contact TEP if there are concerns about tree limbs growing into or around overhead power lines on your property.

- **Call before you dig.** Whether you’re a homeowner landscaping your yard or a professional contractor digging utility trenches, remember to **call 811 or Arizona Blue Stake at 1-800-STAKE-IT (1-800-782-5348)** at least two working days before you dig. It’s a free service, and it’s required by state law.

  **Always** treat all electric lines with caution and respect!
MANAGING PETS

Pets

All dogs more than four months old coming into the state must be vaccinated and licensed within 30 days of entry. Cats do not have to be vaccinated or licensed. To obtain a dog license, you must have a valid rabies vaccination certificate for your animal. If your pet has been vaccinated in another state within the last 3 years, obtain a certificate from your vet before you move. Each county handles pet licensing.

Most cities and towns have laws requiring dogs be on a leash, even when they are on the owner’s private property.

It is especially hazardous to leave animals inside a car during the warm months. Temperatures reach dangerous levels in minutes. Leaving the windows open slightly is not adequate. When the mercury begins to climb, your pet will be much safer if left at home.

Dogs: A Problem for Livestock and Wildlife

When dogs chase animals, they are put under undue stress, which results in lower weight gain and physical injury. People have the right to protect their livestock, and in some cases, will destroy animals that threaten their livestock. It is unlawful to allow pets to harass wildlife. Make sure your pet stays on your property or is under your control at all times.

Desert Pet Protection

You’ll need to protect the family pet from the same risks heat and sun cause for people. Your pet’s feet can become blistered from the hot cement or from standing on hot surfaces. Some short-haired dogs may even sunburn. Avoid walking your pet in the heat of the day. Keep a ready supply of water available and an area that is sheltered from the sun. Garage temperatures can reach 140 degrees, so don’t count on this as a protective environment. If your pet becomes overheated, he will stop panting, become lethargic and refuse food. These signs call for prompt attention. Get the animal out of the sun. Cover him with a towel soaked in cool water and get him to the vet. Be watchful of older dogs and young puppies around pools. Vision problems may cause an older dog to fall into the pool and drown. Puppies lack the strength and stamina to swim across the pool. If you are going to allow your dog in the backyard pool, take the time to teach him how to find the pool steps to get out on his own. Don’t allow access when you are not out to keep an eye on what’s happening.
RESPECTING PRIVATE PROPERTY AND PRIVACY

Many people are unaware of private boundaries when first arriving in the country. Unintended trespass sometimes occurs due to preconceived notions about open range in the West and federally-owned land. It is always your responsibility to know whose land you are on, regardless of whether or not it is fenced. You would not want trespassers so try not to be one.

To keep from trespassing, obtain a county map that clearly shows public lands and roads. Ask first before entering private lands, even when you are doing something as harmless as walking in a meadow.

Many landowners will allow people access within certain guidelines. However, the primary reason it is becoming difficult for landowners to allow recreational access is their liability if someone is injured while on their land. Some landowners, due to privacy desires and liability fears, may not allow access at all. It is a good idea to know where your legal easements are to your property and if there are any other easements on your property that may provide access to others, such as power company, ditch maintenance or water companies or even other land owners.

MINIMIZING CONFLICTS

There is plenty of potential for conflict between new and existing landowners. A better understanding of the reasons behind these conflicts may help us all to become better neighbors.
HELP PRESERVE THE PAST FOR THE FUTURE

Our past is all around us. Wherever you go you may see evidence of earlier human presence. Sites may be ancient settlements or campgrounds, burial grounds, or historic buildings. In the past, people traveled and traded along rivers and lakeshores so traces of those people’s activities are often left behind.

Many important finds are made by ordinary people – you could be next! You may have stumbled across a new site that no one has recorded before. If so, do not disturb anything. Archaeological resources are protected by law on public lands.

Sometimes sites are ruined by people who remove the artifacts or damage the site. Removing or damaging artifacts takes away an important part of the story and denies others the same enjoyment you received in glimpsing a piece of the past. Every artifact is a messenger from the past. Where the object is found and how it fits in with other features and objects at the site is just as important as the object itself. Please take a picture, not a souvenir. Everyone is responsible for respecting and preserving archaeological sites. **If you find an archaeological site, it is important that you do not remove artifacts or damage the site.**

Become involved in protecting your local heritage by joining an archaeological or historical society in your area. Another excellent way to get involved and to learn more about the history of your area is to join the Arizona Site Steward Program. Volunteer stewards monitor historic, prehistoric and paleontological sites for vandalism and natural impacts. The program is sponsored by the State Historic Preservation Office and the public land managers of Arizona. Stewards make an important contribution to preserving our cultural heritage. The Site Steward Program is designed to meet the interests and skills of the volunteers.

For further information about how you can become an Arizona Site Steward call the Program Coordinator at (602) 542-7143
Arizona State Parks, 1300 W. Washington St., Phoenix, AZ 85007

KNOW THE LAW!

There are both federal and state laws against collecting artifacts or damaging heritage resources on public lands. If you are not in your own backyard, you are breaking the law. Human remains are protected on both public and private lands.

The Arizona State Museum administers the Arizona Antiquities Act and state laws concerning the discovery of human remains. In 1990 the Arizona Legislature passed two laws that protect human burials and associated items on both private and State land. These new laws are important to everyone in Arizona. They were passed because of the need to treat human remains and associated items, sacred objects, and objects important to Native Americans with respect and dignity. Violating these laws is a criminal offense. Individuals who think they have come across a situation covered by these laws should first stop any activity that might further disturb the remains or materials and then call or write to the:

**Arizona State Museum, University of Arizona**
Tucson, AZ 85721-0026—(520) 621-4795
FENCE LAW:
A LAW ENFORCEMENT PERSPECTIVE

We have seen increased growth throughout southeastern Arizona. As homes spring up next to existing homesteads, we find that our new neighbors may not be completely in tune with rules, regulations and laws governing our unique area. One important concern regards fencing.

Sheriff’s deputies respond to numerous complaints between neighbors over fences. There are many misconceptions concerning fences, maybe because fences have different meanings all over the world. According to Webster, “fenced” means to keep out as by a fence. This supports the basis of Arizona law.

An example begins with a deputy answering a call from someone concerning his neighbor’s cattle stomping out his flowerbeds. It appears that this individual decided that he did not want anything blocking his view, especially an old fence. He dismantled it, thus allowing the cattle to roam.

Arizona gives livestock owners the flexibility that they need to operate a successful enterprise. Landowners have to fence out livestock if they want to protect their crops, grass, gardens and flowers.

Under Arizona statute, a “lawful fence” is a well-constructed, three-barbed wire fence with substantial posts set a distance of approximately 20 feet apart, sufficient to turn ordinary horses and cattle, with all gates equally as good as the fence, or any other fence of like efficiency. Railroad right-of-way fences constructed in compliance with the statute in force on the date of construction and maintained in good condition are considered legal fences. The term “livestock” is defined to include horses, cattle, mules, donkeys, goats, sheep, swine, and ostriches and emus.

MINDING YOUR FENCES

Under Arizona law, when agricultural landowners share a property line, it is the duty of each to maintain half of the fence or share equally in its construction. Contact adjacent landowners and work out fence maintenance or construction. You can either split the labor and materials equally, or one may supply the labor and the other person supply materials.
**ENJOYING WIDE OPEN SPACES**

**RANGE ETIQUETTE**

**Rangeland** is the land in Arizona where the natural vegetation is primarily shrubs, grasses, and forbs, and areas with open stands of trees. About 80 percent of the land in Arizona is rangeland. The annual rainfall on Arizona’s rangeland ranges from about 4 to 18 inches.

The rangelands of Arizona include the Sonoran and Mohave deserts along the western side of Arizona, and the desert grasslands and oak woodlands of Southeastern Arizona. The rangelands include the chaparral shrub communities below the Mogollon Rim, and the juniper, sagebrush and grassland communities on the Colorado Plateau in northern Arizona.

If you ever find yourself spending some time out on Arizona rangeland, there are a few things you can do to help take care of our rangelands:

1. Leave gates the way you find them. They are there for a reason. Remember that rangeland is fenced to control livestock grazing. Some areas are important for wildlife or recreation, or some other use, and fences are needed to help keep livestock out. On ranches, fences are needed to control where livestock graze, and to keep the livestock on their own ranch, of course. If the gate is closed, leave it closed. If it was open, leave it open.

2. Don’t shoot at windmills, water tanks, signs, or corrals. Water developments are used by livestock and wildlife and are very important in managing rangeland properly. It can also result in the death of many animals due to lack of water.

3. If you pack it in – pack it out. Litter looks ugly, and it can have serious consequences for livestock and wildlife. Keep a litterbag in your vehicle and be sure to use it!

4. Leave range animals alone. Disturbing animals causes stress and forces animals to use up energy getting away from you. Drive slowly if you come near animals, and take some time to watch them and learn more about them.

5. Camp away from established watering places. State law prohibits camping within ¼ mile of a water development. Camping next to water causes animals to avoid coming in to get a drink. If there is no other reasonably available water, you may cause animals to die.

6. Stay on established roads. Driving off roads destroys vegetation, wildlife habitat, and causes soil erosion. Public resource management agencies provide maps that show roads that are maintained for general traffic and 4-wheel drive vehicles.
WHAT EVERY LANDOWNER NEEDS TO KNOW ABOUT RURAL SERVICES

RURAL MAIL DELIVERY
As in town, the U.S. Postal Service will deliver your mail to your mailbox. The catch is the location of your mailbox. The mail person is going to deliver your bills, catalogs, letters from mom and junk mail to the junction of your driveway, or private subdivision road, and the connecting public road. In some instances, this may be miles from your home. This may make picking up the mail a major task, especially on muddy roads. Contact your local mail carrier or post office to see if special considerations apply before buying or building your rural home. And remember, mailboxes need to be 48” from the bottom of the box to the ground.

TRASH
REDUCING CONSUMPTION
In many rural parts of Santa Cruz County there is no curbside trash collection. It may be up to you, the resident, to transport your trash to the local landfill, and there will be a fee. There are many ways that you can cut down the time and expense of trips to the “dump” and help reduce the amount of material that is “trashed” each year.

Moving to the country is a great time to reassess your shopping practices. You’ll save time and gasoline if you keep a running shopping list and maximize your shopping trips. You’ll also cut down on impulse purchase of items you may not need. By buying less, you’ll also have less to throw away! If you buy products in larger size, or in bulk, you’ll generate also generate less trash. Compost as much waste as possible. Yard and garden clippings, along with some kitchen waste can become an asset rather than a liability when given the chance to degrade into high quality compost. It’s a good idea to limit your composting efforts to plant material, as scraps of meat or cheese can draw unwanted wildlife visitors. Check with the County Extension Office for tips on starting up your own composting efforts.

RECYCLE, RECYCLE, RECYCLE!
Most landfills have programs that will recycle aluminum, steel, glass, plastics, cardboard and some paper products. Check with the facility you will be using and follow their guidelines to reduce the waste of our natural resources.

There are four drop off sites for Santa Cruz County Recycling- the Rio Rico Landfill, the Sonoita Elgin Landfill, behind the Post Office in Patagonia, and the Tubac/Amado Transfer Station. There are also several programs in Nogales. For more information on what can be recycled see: http://www.co.santa-cruz.az.us/public_works/solid_waste.html.

LANDFIllS IN SANTA CRUZ COUNTY: The Rio Rico landfill and the Sonoita/Elgin landfill. There is a Tubac/Amado transfer station as well. Waste is an issue: The Rio Rico landfill is estimated to be entirely full and is scheduled to close in 2013. Although solutions are being investigated, it is still important to do what you can to reduce your household waste. See www.co.santa-cruz.az.us/public_works/solid_waste.html for more information.
RURAL ROAD MAINTENANCE

The teeth-jarring, mud-rutted, wash board, dust-choked roads we have in rural Santa Cruz County are a rude awakening to most folks new to country living. Before you buy, be sure you know the designation of the roads to your property. All state roads and many county roads are maintained year-round, but that maintenance may only occur every few months, depending on how busy the various road departments are. Some roads have high traffic volume, which tends to degrade road quality quickly.

Even if the roads to your property are county roads, they may not be maintained year-round. In addition, many roads in rural Santa Cruz are not county roads. You and your neighbors will have to do the maintenance yourselves, or hire a professional. If you and your neighbors decide to bring in rock or gravel for your roads, be sure to purchase the gravel from a reputable contractor. A load of rock contaminated with seed of an invasive plant may cause years of problems for you and your neighbors.

If there are dry washes crossing the road, remember they do run when it rains, so don’t enter them when they are running. Don’t be tempted to try to re-engineer those crossings without consulting the county flood control officer. Many waterways, even if they are on your deeded land, are regulated.

Remember, the roads to your home are virtually the only way emergency crews can reach you in case of fire or medical emergency. Be certain to post green house numbers (available at the Santa Cruz Building Department) where they are visible to emergency crews. If you’ve built a new home, be certain the fire/emergency station nearest you knows how to reach your home. It is critical to ensure your road is passable by emergency equipment. If they can’t find you or get to you – they can’t help you! Road maintenance is an issue you and the neighbors need to share.

For more information on roads, visit: http://www.co.santa-cruz.az.us/public_works

Vehicle Registration

Arizona law very clearly requires that new residents register their vehicles. There is a stiff fine ($300) if you fail to do so. A non-resident must register a motor vehicle in Arizona upon establishing residency, accepting employment, enrolling children in a public school, or staying in the state for seven months or more during the year.

Application for registration and title is made with your local Department of Motor Vehicles. Only residents of Maricopa and Pima Counties must obtain an Emissions Compliance form from an emissions testing station before applying for registration.

You will be required to:
• Turn in your out-of-state plates.
• Furnish your previous registration card.
• Obtain a Level 1 inspection slip from an MVD auto license office.
• Present the previous title, if from a title state.
• Prove lien clearance, if applicable.
• Show a notarized bill of sale, if from a non-title state, and official verification that no lien exists against the vehicle.

Personalized plates are available for an initial fee of $25 plus $25 per year, in addition to the regular costs of plates and registration.
**UTILITIES**

By Marshall Magruder

**Water and Sewage Utilities:**
The City of Nogales operates a municipal water, garbage and sewage company which has met the Arizona Department of Water Resources (ADWR) Assured Water Supply (AWS) requirements and allowances for many hundred new homes. Rio Rico Utilities operates the second largest water company, which also includes a sewage component. The rest of the county has either small (less than 1,000 customers) water companies (some with sewage components) or share wells (up to four per well), or have their own water well. ADWR determines the water supply and demands in the aggregate before issuing any of these companies AWS certificates.

For more information, see Rio Rico Utilities website at: www.azruco.com/PC_Rio_Rico.htm

**Electric Companies:**
We have three which service this county. The largest is UNS Electric, which serves the Santa Cruz and San Rafael Valleys with about 17,000 customers. There are four distribution substations in Amado, central Rio Rico, southern Rio Rico and Nogales that distribute electric power to customers from a 115 kV transmission line from southern Tucson. UNS Electric is planning on upgrading this line to 138 kV and improving reliability by changing from wooden H-frame poles to steel monopoles. The Sulphur Springs Valley Electric Cooperative (SSVEC) is the second largest company with customers in Patagonia, Sonoita, and Elgin in the eastern part of the county. TRICO rural utility serves a very small part of the northwest corner of the county.

For more information, see the following Electric Cooperative websites:
UNS Electric—www.uns.com
SSVEC—www.ssvec.com
TRICO—www.trico.org

**Natural Gas Company:**
UNS Gas serves the entire county; however, only customers fairly near to its two gas lines are able to be served and it is operating near capacity. One line goes to Nogales, which parallels to the west of Interstate 19 while the other parallels S.R. 83. Natural gas is also the primary fuel for UNS Electric's four turbines in Nogales that provide backup power. There is a proposal from the DKRW Company to run a new natural gas line from Nogales, Sonora, to Nogales, Arizona then northward to connect with El Paso Natural Gas to the east of Tucson. This will be a major gas line with 500,000 cubic feet of gas per day which is to come from a new LNG liquid-to-gas conversion plant being planned for Puerto Libertad, Sonora. Unfortunately, DKRW has not been able to obtain Liquefied Natural Gas (LNG) for this project, which will take at least three years to complete after gas agreements are signed. Its route in Santa Cruz County is not known. For more information, see the UNS Gas website at: www.uns.com
SUSTAINABILITY PROGRAMS

Demand Side Management Programs:
UNSE and UNSG both have programs to provide incentives to their customers to reduce their demand for electricity and natural gas. Both participate in the Department of Energy EnergyStar Home® program. During recent county planning and zoning meetings, new developments are being required to have at least 20% of their homes EnergyStar certified, which will reduce by at least 25% their electric and/or natural gas demands with resultant savings for homeowners. These utilities will manage the program, provide guidance to builders, obtain certified home inspectors, and issue EnergyStar certificates along with $400 for each homeowner. Additional programs involve rebates for commercial renovations to improve energy efficiency, higher Seasonal Energy Efficient Ratio (SEER) ratings for air conditioners and higher Annual Fuel Utilization Efficiency (AFUE) rating for gas heaters, and even a “shade tree” rebate program. These are all new since 2008 and several already are appearing to be successful. TRICO and SSVEC have similar programs.

Solar and Renewable Energy Programs:
On 10 April 2008, the Arizona Corporation Commission (ACC) approved new renewable energy programs for UNSE, TRICO, and SSVEC. The new ACC Renewable Energy Standard and Tariff (REST) program requires all electric service companies to achieve 15% of its electrical energy by renewable energy sources by 2025, increasing capabilities for each year between now and then. On January 1, 2008, only four solar-electric systems were connected to the grid in the UNSE service area. This will greatly increase under the new REST program. There are several dozen homes that are completely off the grid, especially when long electric lines would be required to reach the home. It is predicted we should have at least a dozen new solar electric homes every year and if some anticipated break-throughs occur, many more will be installed. Solar hot water heaters are also provided incentives under REST, so many more of these very cost-effective systems will be installed. The First Annual Santa Cruz County Solar Energy Expo was held in November 2007 with over 150 attendees and eight displays. One working solar electric system and the University of Arizona Solar Racing Car were the best displays of the show. Presentations on solar, energy efficiency, demand side management, and cost of solar systems proved very beneficial to the attendees. This Expo has resulted in several new solar electric and hot water systems being installed in our county. Also, Cochise County and Green Valley have used this grass roots process for their solar Expo’s.

The sun is bright, our stars are shining, and the future looks good for sustaining water, improved air quality, and energy independence in Santa Cruz County by aggressively reducing our energy demands while shifting to renewable energy (and clean) sources.
RURAL SEWAGE DISPOSAL
It’s Your Responsibility

If you are new to rural life you probably have never given much thought to what many consider one of the quaintest aspects of living in “the country”—the septic system. It is one of the home ownership responsibilities that can have environmental consequences far beyond the boundaries of your property.

A septic tank provides a place for the wastewater flow to slow down so that solids can settle out. The remaining wastewater flows into the leach field where it percolates through soil, which cleanses it. It’s simple, and works well if you follow the rules.

The State of Arizona has empowered local boards of health to enforce the rules of on-site sewage disposal systems through the county health departments. These rules are very important because septic systems, if installed or maintained improperly, have the capability to contaminate ground water from which rural people draw their drinking water. Sewage that invades ground water can contain organisms that cause dysentery, hepatitis, typhoid and other diseases.

If a septic tank fills up with solids, the solids will reduce the available tank volume to the point where the solids are discharged in the outlet of the absorption field. Once in the leach field, the solids clog the soil openings (pores) and block the flow of liquid into the soil. This causes the system to fail, and a major expenditure is required to replace the system.

Another problem landowners run into is not knowing the location of their leach field and septic tank, which is important when doing any construction or major landscaping on your property. Once the integrity of the field is breached by excavation or invaded by large tree roots, it may lose its effectiveness.

Landscaping should be limited to deep-rooted perennial grasses which, when their roots reach the liquid effluent, helps deplete subsurface saturation of the soil. This reduces the chance of developing wet spots within the leach field.

The most common septic system failure is lack of proper maintenance. Maintenance is strictly up to you, the homeowner, and maintenance is critical! A good recommended interval for having the septic tank pumped is about every five years. So be sure you know where the lid to the tank is so you can check it and maintain it.

There is really only one reason for building a new septic system— the building of a new residence where there was no residence before. Arizona law requires that before a person constructs, remolds, occupies or maintains any dwelling, he must first complete a permit for an individual sewage disposal system.

There are a variety of subtleties in this process. The County Health Department staff can make the intricacies of the process seem a little less intimidating.
Standards for septic systems in and adjacent to floodplain and erosion hazard areas in Santa Cruz County:

The Santa Cruz County Floodplain and Erosion Hazard Management Ordinance #2001-03 regulates the activities within all regulatory floodplains and erosion hazard areas within unincorporated Santa Cruz County, including the installation of new septic systems. A regulatory wash is any wash that has been mapped on the federal Flood Insurance Rate Maps, any subdivision plat map, or has a peak discharge of 50 cubic-feet of water per second during a 100-year storm event. A good rule of thumb is it takes ten acres of drainage for a wash to develop the necessary discharge. Therefore, any wash draining 10 acres of land or more at the point where work is to be done in or along the wash or any property in any mapped floodplain should be cleared through the Santa Cruz County Flood Control District via a Floodplain Use Permit prior to the start of construction.

Please be advised that the Santa Cruz County Flood Control District requires that if it is possible to place a building, septic system, or other improvement outside of the floodplain limits on a property, then the improvement must be placed outside of the floodplain. For septic systems, this typically means the use of an alternative system. Only if it is physically impossible to place the septic system, or any type of alternative system, anywhere else on the lot will the Santa Cruz County Flood Control District consider the permitting of a septic system in a flood prone area. If the lot is not mostly, or entirely regulatory floodplain, the impossibility of being able to locate any type of septic system on the lot would need to be certified by an Arizona Registered Professional Civil Engineer.

All septic systems must be set back a minimum distance from the top of bank of any wash. The distance required is a function of the discharge of the wash and the amount of curvature of the wash. These setbacks can be reduced via engineering meeting County Standards. However, under the Ordinance, the minimum setbacks are 20 feet for straight channels, and 50 feet for meandering channels. The Santa Cruz County Flood Control District will set the erosion hazard setback for any system coming under review for a Floodplain Use Permit.

All septic systems to be located within a flood prone area are required to have anti-backflow valves to prevent floodwaters from flushing the septic system back into the structure being serviced.

### Septic

**Applicable Areas:** Anyone who resides in an area who wishes to construct any type of sewage disposal system.

**Procedure:** An application for a Certificate to Construct must be obtained from the County Health Department before any sewage disposal system is constructed. You may also obtain the required standards and specifications for sewage disposal systems from the Health Department.

A fee must be paid before a Certificate to Construct will be issued.

Contact the County Health Department a minimum of five (5) working days prior to the completion date so an inspection can be arranged.

All systems will be inspected at least twice.

For more information on Septic Systems, visit: [http://www.co.santa-cruz.az.us/health](http://www.co.santa-cruz.az.us/health)
Unlike urban areas that have emergency services within a short distance of most homes, rural emergency services may be many miles away and often staffed with volunteers. Rural roads slow even fire trucks down, and in rapidly growing areas new roads and addresses may not be on maps. Before you buy property here, contact the emergency service providers in the area to determine the level of risk you will assume in that location. Some areas of Santa Cruz County are outside of delineated fire districts, so those folks may or may not have access to emergency services. You may pay more for property insurance if you are not in a fire district.

Fire in an urban setting is almost always a frightening, destructive force. But in the rural areas of Santa Cruz County, fire is a natural process that maintains the health of the ecosystems. Naturally occurring fires will be started by lightning, and humans will cause other fires, either accidentally or on purpose. Just because fire may be good for the grasslands and forests of Santa Cruz County doesn’t mean you will want to lose your home to a fire. Knowing more about rural fires will help you make sound decisions.

Two types of fires occur, structural and wildfire, and each type requires specialized equipment and training for those charged with fighting the fire. A structural fire, such as one started by faulty wiring in a home, may spread to the wild land surrounding it, and a wildfire can certainly burn homes and other structures. There are several federal and state agencies with responsibilities to fight wildfires in Santa Cruz County, but these crews are not trained or equipped to fight structural fires.

Before you buy or build a home, determine which fire department (if any) has jurisdiction over the area. That’s right – there are some remote areas that have no primary fire department charged with structure protection. That doesn’t mean no one will come to help you, but if they are needed in their own district you’ll have to wait. Also consider the availability of water to fight a fire on that property. In a rural community, it may be extremely difficult to get sufficient water to a fire. Tanker trucks to transport water may be available, but distance and road/driveway conditions may be a problem.

Even if you live in a fire district, there is no guarantee that your home will be saved. Volunteers are the backbone of most fire districts in Santa Cruz County, and seldom are there enough trained personnel and necessary equipment to protect every structure that may be threatened. Firefighters must choose, under stressful conditions, which homes can be defended, and which cannot. The actions you take now to protect your home may make the difference.
Planned burns: Sometimes ranchers, farmers or agency personnel conduct prescribed burns, and sometimes homeowners may wish to use fire to clear debris. Don’t ignite a fire before you know the rules! All counties in Arizona adhere to the State Air Pollution Control Regulations, which require an Open Burning Permit. If you live in the Sonoita-Elgin, Tubac or Rio Rico fire districts, call your fire department* to request an Open Burn Permit. For all other areas of Santa Cruz County, contact the Arizona Department of Environmental Quality*. Prior to any open burning, permission must also be obtained by calling the local fire district and/or sheriff’s dispatch*. At that time, authorities can insure that proper environmental conditions exist, and avoid any false alarms by knowing the location of a proposed fire.

If you choose to live in a rural area, be aware that all counties allow agricultural open burning for preparing soil for crop production, weed control and other agricultural purposes. Most federal and state agencies use prescribed fire as a management tool to protect the health of the land. The smoke generated by these fires may aggravate respiratory issues, so be certain you and your family can cope with this situation.
WILDFIRES

Wildfires in rural neighborhoods are a very real and potentially hazardous problem. No one is immune to this threat. To reduce the risk of losing your home to wildfire, it is recommended to do the following:

1. Thin out continuous tree and brush cover within 30 feet of your home. Adequate thinning is reached in this “defensible space” when the outer edge of tree crowns are at least 10 to 12 feet apart. Occasional clumps of 2 or 3 trees are okay for natural effects if more space surrounds them. Small patches of brush or shrubs may be left if they are separated by at least 10 feet of irrigated grass or non-combustible material. If your home is on a slope, enlarge the defensible space, especially on a downhill side. If it is located at the crest of a steep hill, thin fuels (trees, brush, etc.) at least 100 feet below the crest.
2. Dispose of all slash and debris left from thinning by lopping and scattering, piling and burning (when conditions are safe) or chipping and composting.
3. Remove dried tumbleweeds, leaves, and other ground litter within the defensible space and away from fences.
4. Stack firewood at least 15 feet from your home.
5. Maintain an irrigated greenbelt immediately around your home using grass, flower gardens, or ornamental shrubbery, or use rock or other non-combustible material. Avoid using bark or chip mulch.
6. Mow or graze dry grasses and plants close to all combustible structures.
7. Prune branches from trees within the defensible space to a height of 10 feet above the ground. Also remove shrubs, small trees, or other potential “ladder” fuels from beneath large trees; left in place, these can carry a ground fire into tree crowns.
8. Trim branches, which extend over the eaves of your roof. Remove branches within 15 feet of a chimney.
9. Clean roof and gutters of pine needles and leaves to eliminate an ignition source for firebrands, especially during the hot, dry periods.
10. In high fire season, have sufficient hose attached to hydrants to reach all structures.
11. Consider forming a Firewise community with your neighbors. Jointly, you can take steps to protect you and your homes that would be difficult to accomplish by yourselves.
12. See www.firewise.org for more information on ways that you can develop defensible space around your home. **It's not a question of IF, it's a question of when!**

- Wildfires occur in all seasons of the year. It is a common myth that they occur only in the summer.
- Wildfires occur in all fuel types. Grass, brush and trees are all equally susceptible.
- Wildfires occur in all sizes. A small fire is as capable of destroying your house as a large fire.
- Wildfires may move with incredible speed. Most people are caught totally by surprise, with only a few minutes to collect their most prized possessions and evacuate to safety.
Evacuation Tips:

- If a wildfire is threatening your area, listen to your radio for updated reports and evacuation information.
- Confine pets to one room and make plans to take care of them in the event of evacuation.
- Arrange for temporary housing with a friend or relative whose home is outside the threatened area. Leave a note in a prominent place in your home that says where and how you can be contacted.
- If your home is threatened by wildfire, you will be contacted and advised by law enforcement officers to evacuate. If you are not contacted, or you decide to stay and help defend your home, evacuate pets and any family members not needed to protect your home.
- Remove important documents, mementos, etc. from the possible fire area.
- When evacuating, wear protective clothing: sturdy shoes, cotton or woolen clothing, long pants, a long-sleeved shirt, gloves, and a handkerchief to protect your face.
- Choose a route away from the fire if possible. Watch for changes in the speed and direction of the fire and smoke.
- Take a disaster supply kit containing:
  - A supply of drinking water
  - One change of clothing and footwear for each member of the family
  - A blanket or sleeping bag for each person
  - A first aid kit that also includes any prescription medications
  - Emergency tools including a battery-powered radio, flashlight and extra batteries
  - An extra set of car keys and credit cards, cash or traveler’s checks
  - Extra pairs of eyeglasses and other special items for infant, elderly or disabled family members.

Defending Your Home:

Do not jeopardize your life. No material item is worth losing a life over. Whether you choose to stay to defend your home or to evacuate, complete as many of the following preparations as possible:

- Wear fire-resistant clothing and protective gear.
- Remove combustible materials from around structures.
- Close or cover outside vents and shutters.
- Position garden hoses so they reach the entire house. Have the hoses charged, with an adjustable nozzle, but turned off.
- Place large, full water containers around the house. Soak burlap sacks, small rugs or large rags in the containers.
- Place a ladder against the roof of the house on the opposite side of the approaching wildfire. Place a garden hose near the ladder, prepared as described previously.
- Place portable pumps near available water supplies, such as pools, hot tubs, creeks, etc.
- Close all windows and doors. Do not lock them.
- Close all inside doors.
- Turn on a light in each room, and all outside lights. Leave them on even during daylight hours.
- Fill tubs, sinks and any other containers with water.
- Shut off the gas at the outside meter of the propane tank.
- Remove lace, nylon or any other drapes and curtains made from light material. Close Venetian blinds, heavy drapes or fire-resistant window coverings.
- Move overstuffed furniture into the center of the house, away from windows and sliding glass doors.
- Park your car in the garage, facing out. Close the windows but do not lock the doors. Leave the keys in the ignition.
- Close the garage door but leave it unlocked and disconnect the automatic garage door opener.
WILDFIRES CONTINUED...

The Santa Cruz County Evacuation Points for Fire Emergencies are:
Nogales Recreation Center
Nogales High School multi-purpose room
Desert Shadows Middle School
Rio Rico High School multi-purpose room
Elgin Elementary multi-purpose room
Patagonia High School and Middle School multi-purpose room
Patagonia Community Church

* If you live in an area without fire hydrants and have an above-ground water tank, consider putting a fire department connection on your water tank.

More information about fire and fire safety can be found on the Arizona Firewise website:  
http://cals.arizona.edu/firewise/index.html

The site provides fire data, preventative measures, recovery methods, fire education materials, and more for the state of Arizona.

The Billy Brushwacker curriculum for children ages 8-11 can also be found on the Youth Education portion of the Arizona Firewise website http://ag.arizona.edu/firewise/youth.html. Fire education programs can be used to inspire children to prevent fire and become more safety conscious. The Billy Brushwacker curriculum is designed to meet Arizona Department of Education Standards and can be used by teachers to meet science education requirements.

For more local fire information, visit the Sonoita-Elgin Fire District Website  
http://www.sonoitaelginvolunteerfire.org/index.htm

This volunteer group of fire fighters serves Sonoita, Elgin, and Canelo communities. The site also contains information about local fire prevention, fire news, and also information for current and potential volunteers.

Santa Cruz County Emergency Management can provide more county-specific information and more on evacuation points and plans. They can be contacted at (520) 375-8000. Your local fire department can also be a good resource, particularly for area-specific information.

Fire Department Contacts:

Tubac Fire District: (520) 398-2255
City of Nogales Fire Department: (520) 287-6548
Nogales Suburb Department: (520) 281-1126
Rio Rico Fire District: (520) 281-8421
Patagonia Volunteer Fire and Rescue: (520) 394-2091
Sonoita-Elgin Fire District: (520) 455-5854

Act now - don’t wait until you see the smoke on the horizon!
Wildfires can occur in all seasons of the year, in all fuel types, and can move with incredible speed!
People are a wonderful asset to southern Arizona. Having so many different cultures allows for a diversity seldom seen in other parts of the United States. Please remember that although this may be a vacation wonderland for many, crime doesn’t take a vacation from here. People may feel a false sense of security, thinking that a more rural environment doesn’t have the problems that cities have. By ratio of population to crime, we see that southern Arizona is not free of the nationwide statistics of crime. Having awareness that crime is everywhere, accompanied by common sense, will lessen your chances of becoming a target.

Law enforcement in the unincorporated areas of the counties and some towns falls to the sheriff’s office. The sheriff is an elected official who provides multiple services to the citizens within county lines. Deputies patrol roads and answer emergency calls 24 hours a day and detectives investigate any major crimes.

Sheriff’s offices have programs such as Community Policing and Neighborhood Watch. DARE (Drug Abuse Resistance Education) is provided to area schools, along with a school resource officer to educate students on a positive, drug-free attitude.

Due to the large number of ranching and farming operations, certain members of the sheriff’s office have specialized training in these areas. Water in southern Arizona is a valuable commodity and is a criminal offense when taken illegally.

Historically, the sheriff has an “open door” policy when it comes to communicating with the public. Citizens can come by the office and meet with their law enforcement personnel. Communication is a two-way street that allows the sheriff to understand the needs of the community, and at the same time, receive complaints or compliments. Due to our location, we have a high incident rate of trespassing traffic by illegal immigrants.

If you experience this type of trespassing, call the Border Patrol Office (Sonoita) 520 455-5051 (All Other) 520 377-6200 or the Sheriff’s Office (Emergency) 911 — (Non-Emergency) 520-761-7869.
HEALTH CARE

Mariposa Community Health Center provides the following direct client services and clinical programs under contracted to the Santa Cruz County Health Department.

- Women Infants and Children (WIC)
- Nutrition
- Immunizations
- Maternal and Child Health
- Tuberculosis Prevention and Control
- STD/HIV Prevention and Control

For client services or information contact:

Mariposa Community Health Center
1852 N. Mastick Way, Nogales, AZ 85621
Phone: (520) 281-1550
Or visit their website at www.mariposachc.net

Nogales Clinic
480 N. Morley Ave., Nogales, AZ 85621
Phone: (520) 287-2726

Mariposa Community Health Center
Rio Rico, AZ
Phone: (520) 377-9410

Family Health Center
Patagonia, AZ
Phone: (520) 394-2262

HOSPITALS

Carondelet Holy Cross Hospital
1171 w. TARGET Range Rd.
Nogales, AZ 85621
Phone: (520) 285-3000
Visit their website at www.carondelet.org

The Carondelet Holy Cross Hospital in Nogales offers:
- 24-Hr. Emergency Care
- Complete Medical/Surgical Services
- Women and Infant Services
- Rehabilitation Services
- Occupational Health
- Inpatient and outpatient Care
- Hospice Services

Tucson, in Pima County, has many additional hospitals
AGRI CULTURAL AND ENVIRONMENTAL EDUCATION

There are a number of environmental education opportunities offered through elementary, middle, and high schools throughout Santa Cruz County. Many schools have created schoolyard gardens, have recycling programs, have experimented with alternative building methods, and/or have created and participated in outreach to other schools and communities about environmental issues. Some high schools even offer opportunities for students to do their own research on these topics. Often these projects are associated with science classes or ecology clubs.

Contact the U of A Extension Office at (520) 284-2994 to see what educational activities/curricula is available through the Santa Cruz NRCD Ed Center, located at the Santa Fe Ranch.
AGRICULTURAL PARTNERSHIPS

State and Federal Agencies That Offer Agriculture and Natural Resources Assistance

NATURAL RESOURCE CONSERVATION DISTRICTS:

Natural Resource Conservation Districts (NRCD’s) were created under state law during the dust bowl days of the 1930’s to help farmers and ranchers overcome severe erosion problems. Three locally elected and two appointed supervisors govern each District. They provide guidance and set priorities for the area. They also review subdivision proposals and reclamation plans for gravel pits, strip mines, and oil and gas well sites. Technical assistance is provided through the USDA Natural Resources Conservation Service.

The Natural Resource Conservation District is your voice in the community for conservation concerns. NRCD’s have lobbying power at the state and national level to seek solutions to problems faced by the people of their District. They also provide educational displays, such as ground water and runoff models, information booths at agricultural and recreational events, and sponsor conservation poster contests in the schools. They have working agreements with state and federal agencies, such as Arizona Game & Fish Department, Arizona State Land Department and Bureau of Land Management. The districts are always looking for help and support from conservation-minded people.

The Santa Cruz NRCD serves Santa Cruz County. For more information on how to get involved, contact the Natural Resources Conservation Service office in Tucson at (520) 292-2999.

NATURAL RESOURCES CONSERVATION SERVICE:

The Natural Resources Conservation Service (NRCS) is an agency of the United States Department of Agriculture, established to assist private landowners in making decisions on how to manage the resources on their land. The agency has expertise to deal with most types of land use - from developing a ranch plan to designing an irrigation system.

Services to the public include developing irrigation, grazing and wildlife plans for local landowners, taking into consideration soil, water, plants and animal resources. The NRCS engineering staff can survey and design irrigation systems, irrigation water pipelines and ditches, water control structures, stock watering facilities and wildlife ponds. NRCS staff are also involved with educating school children and the general public on various resource-related subjects such as water quality, soils, weed control, vegetative management, wildlife habitat development and management, wetland and riparian management and windbreak and shelterbelt development. These services are provided by the Department of Agriculture at no additional charge to landowners.
Agricultural Partnerships Continued:

NRCS PLANNING ASSISTANCE—MAKING A PLAN FOR YOUR PROPERTY

Making a plan for the wise use of your resources is important because it serves as a guide to reaching your goals for that land. Considerations include deciding how you want your property to look, if you intend to make an income from it, and to see if the land will support what you want to do. It is difficult to see where you are going if you’ve never been there. A plan will provide a map to the future. Once you’ve digested the material in this handbook, you may want to have an objective evaluation from a professional. NRCS staff members can help you develop a conservation plan to fit your property. Contact the local Natural Resources Conservation Service in your area for more information.

NRCS COST SHARE ASSISTANCE
ENVIROMENTAL QUALITY INCENTIVES PROGRAM (EQIP)

The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that helps agricultural producers in a manner that promotes agricultural production and environmental quality as compatible goals. Through EQIP, farmers and ranchers receive financial and technical assistance to implement structural and management conservation practices that optimize environmental benefits on working agricultural land.

EQIP applications are accepted through a continuous sign-up process. NRCS-Arizona periodically announces cutoff dates when applications are ranked for funding. For additional information about this or any Farm Bill Conservation Programs, visit our website at www.az.nrcs.usda.gov and to apply for a program, contact the Tucson NRCS Service Center at (520) 292-2999.

NRCS PARTNER AND PROJECT ASSISTANCE
RESOURCES CONSERVATION AND DEVELOPMENT

NRCS administers and provides technical assistance to the Coronado Resource Conservation and Development Area (RC&D) that is a locally directed and sponsored program to help local leaders develop strategies to protect, conserve and utilize natural resources and improve the local economies. The RC&D program is governed by a council made up of representatives of the towns, cities, counties, conservation districts and other non-profit organizations within the RC&D area. The Coronado RC&D area encompasses Graham, Greenlee, Santa Cruz, Pima and Cochise counties.

The RC&D Council provides a forum to review project feasibility and assist in the development of a comprehensive plan to see that the project objectives are met. The Council works with, and through, many individuals and agencies to provide technical assistance, research sources of funding, and aid in project management, proposal development and grant writing.

The Coronado RC&D area is bounded by the country of Mexico on the south and New Mexico on the east. It has a land area of nearly 15 million acres. Twenty-one percent of the land is privately owned, fifty-five percent is federally and state administered with the remaining twenty-four percent being Indian Reservation land. The RC&D area includes five counties, seven natural resource conservation districts, and one soil and water conservation district with a rural population of about 175,000 people. Farming, ranching, mining and tourism are the major sources of income.

Coronado RC&D
656 N. Bisbee Ave.
Willcox, AZ 85643
(520) 384-2229 x122
Fax: (520) 384-2735
coronadorcd_council@yahoo.com
www.coronadorcd.org
WEB BASED RESOURCE DIRECTORY

Agencies/Government
Arizona Department of Agriculture:  http://www.azda.gov/
Arizona Department of Game and Fish: http://www.azgfd.com
Arizona Department of Water Resources: http://www.water.az.gov/
Arizona State Health Department:  http://azdhs.gov/phs/oids/vector/rabies/
Arizona State Land Department: http://www.land.state.az.us/support/faqs.htm
Bureau of Land Management: http://www.blm.gov
Natural Resources Conservation Service: http://www.nrcs.usda.gov/
Santa Cruz County (Arizona): http://www.co.santa-cruz.az.us

Building
Santa Cruz County (Arizona): http://www.co.santa-cruz.az.us
Planning & Zoning: http://www.co.santa-cruz.az.us/com_development/planning.html

Community
Sonoita Crossroads Community Forum: http://www.hanks ville.org/crossroads/

Fire Education
Audubon: http://www.audubon/local/sanctuary/appleton.org/
Role of fire in maintaining ecosystems. Tips to protect your home.
Firewise: http://www.firewise.org/
Educational information to help protect your home from wildfire.

Land Management and Conservation
Audubon: http://www.audubon/local/sanctuary/appleton.org/
Living Gently on the Land educational program
Land Help: http://www.landhelp.info/
References on wide range of topics associated with land management, including a template to develop a land management plan.
Technical Advice, Publications, Conservation Funding Opportunities
The Nature Conservancy: http://www.azconservation.org

Plants
Alien Plant Working Group:  http://www.nps.gov/plants/alien
Definitions, Fact Sheets, Lists of Invasive Plants, Impacts of invasive species
Arizona Department of Agriculture:  http://www.azda.gov/
  Information on Protected Plants: http://www.azda.gov/ESD/nativeplants.htm
Arizona Department of Game and Fish: http://www.azgfd.com
Arizona Master Gardener Manual:  http://ag.arizona.edu/pubs/garden/mg
  Cooperative Extension, College of Agriculture, University of Arizona
Arizona Native Plant Society: http://www.aznps.org/
  Invasive species information
  Sources for native plants
  Backyard ponds/ Water features
  Plant laws
Arizona-Sonora Desert Museum: http://www.desertmuseum.org/
Audubon: http://www.audubon/local/sanctuary/appleton.org/
  Living Gently on the Land educational program
Plants (continued)
Bureau of Land Management: [http://www.blm.gov](http://www.blm.gov)
  Frequently Asked Questions about weeds: [http://www.blm.gov/weeds/FAQs/FAQs.htm](http://www.blm.gov/weeds/FAQs/FAQs.htm)
  Desert gardening, landscaping, horticulture.
  Educational information to help protect your home from wildfire.
Southwest Environmental Information Network: [http://seinet.asu.edu/seinet/index.jsp](http://seinet.asu.edu/seinet/index.jsp)
  Information and links to photos and locations of many organisms found in the Southwest. Website is geared for professionals, but the determined homeowner will find much information on plants, mammals, reptiles, amphibians, birds
Tucson Audubon Society: [http://www.tucsonaudubon.org](http://www.tucsonaudubon.org)
  Water Harvesting, Enjoying birds in your backyard, Wildlife rehabilitators
  Educational programs; Information on gardening; Native plants
  Includes photos, species descriptions and locations of native plants, also lists of invasive and noxious weeds, threatened and endangered species. Soils info.

Water
  Workshops, recommended reading list
Sustainability of semi-Arid Hydrology and Riparian Areas: [www.sahra.arizona.edu/wells/](http://www.sahra.arizona.edu/wells/) information on wells
Tucson Audubon Society: [http://www.tucsonaudubon.org](http://www.tucsonaudubon.org)
  Water Harvesting
  Programs and literature to help use water wisely and efficiently.
  Keywords: Arizona, Sonoran Desert
  Interactive map tracking water level trends
  Water harvesting
  Water saving
  Outdoor water saving
Water Resources Research Center: [http://cals.arizona.edu/azwater/](http://cals.arizona.edu/azwater/)
  Publications and reports related to water availability

Wildlife
Arizona Department of Game and Fish: [http://www.azgfd.gov](http://www.azgfd.gov)
  Injured, sick or orphaned wildlife
  Wildlife rehabilitators
  Frequently Asked Questions (FAQs)
  Landscaping for desert wildlife Keywords: native plants
  Wildlife related diseases Keywords: rabies
  Nongame species: all wildlife except game mammals, game birds, furbearing animals, predatory animals, and aquatic wildlife Keywords: bats, shrews, birds, lizards, fish
  Living Gently on the Land educational program
Partners in Amphibian and Reptile Conservation: [http://www.parcplace.org](http://www.parcplace.org)
Poison and Drug Information Center (University of Arizona): 1-800-362-0101
  General: [http://www.pharmacy.arizona.edu/outreach/poison/](http://www.pharmacy.arizona.edu/outreach/poison/)
  Venomous creatures: bees, spiders, snakes, scorpions, conenose bugs
Tucson Audubon Society: [http://www.tucsonaudubon.org](http://www.tucsonaudubon.org)
  Enjoying birds in your backyard, Wildlife rehabilitators.
  Reptiles, amphibians, snakes, lizards, toads


A DIRECTORY OF
RURAL SERVICES IN SANTA CRUZ COUNTY

Education

School Districts:
Nogales Unified (520) 287-0800
Patagonia Elementary & Union High (520) 394-3050
Santa Cruz Elementary (520) 287-0737
Santa Cruz Valley United (520) 281-8282
Sonoita Elementary (520) 455-5514

Higher Education - Nogales
Cocheise College (520) 287-5583
Northern Arizona University (520) 287-0102
Southeast Arizona Area Health Education Center (520) 287-4721
University of Arizona Cooperative Extension (520) 284-2994
University of Phoenix (520) 377-2290

Emergency Services

Poison Control (800) 362-0101

Fire and Emergency

CALL 911

Fire (Non-emergency)

Amado: Elephant Head Volunteer Fire Dept. Inc. (520) 398-9806
Nogales:
City of Nogales Fire Department (520) 287-6571
Nogales Suburban Fire District (520) 287-2324
Patagonia:
Patagonia Volunteer Fire & Rescue (520) 394-2337/2936
Rio Rico:
Rio Rico Fire District (520) 281-8421/8194
Sonoita/Elgin:
Sonoita/Elgin Fire District (520) 455-5854
Tubac-Tumacacori:
Tubac-Tumacacori Fire District (520) 398-2255

Grazing

Arizona Department of Agriculture (602) 542-4373
Livestock (lost and found) (800) 294-0305
Bureau of Land Management Dispatch (623) 580-5515
## Law Enforcement

**EMERGENCY**

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
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<tbody>
<tr>
<td>Sheriff (non-emergency)</td>
<td>(520) 761-7869</td>
</tr>
<tr>
<td>Arizona Border Patrol:</td>
<td></td>
</tr>
<tr>
<td>Sonoita substation</td>
<td>(520) 455-5051</td>
</tr>
<tr>
<td>All other (Nogales)</td>
<td>(520) 377- 6200/6000/6208</td>
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**CALL 911**

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## Mail Delivery and Rural Addressing

<table>
<thead>
<tr>
<th>Town</th>
<th>Number</th>
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<tbody>
<tr>
<td>Amado</td>
<td>(520) 398-2580</td>
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<tr>
<td>Nogales</td>
<td>(520) 287-9246</td>
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<tr>
<td>Patagonia</td>
<td>(520) 394-2950</td>
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<tr>
<td>Sonoita</td>
<td>(520) 455-5500</td>
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<tr>
<td>Tubac</td>
<td>(520) 398-2580</td>
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<tr>
<td>Tumacacori</td>
<td>(520) 398-2580</td>
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## Santa Cruz County Government

<table>
<thead>
<tr>
<th>Department</th>
<th>Number</th>
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<tbody>
<tr>
<td>Building Dept. (permits and green house numbers)</td>
<td>(520) 375-7880</td>
</tr>
<tr>
<td>Cooperative Extension (University of Arizona)</td>
<td>(520) 281-2994</td>
</tr>
<tr>
<td>Public Works (Roads, Flood Control, Waste Mgt)</td>
<td>(520) 375-7830</td>
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## Trees and Forests

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
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<tbody>
<tr>
<td>Arizona Forest Service Dispatch</td>
<td>(520) 281-2296</td>
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## U.S. Military Post

<table>
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<tr>
<th>Service</th>
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<tbody>
<tr>
<td>Fort Huachuca Military Post</td>
<td>(520) 533-3773</td>
</tr>
<tr>
<td>West gate checkpoint</td>
<td>(520) 533-3773</td>
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## Utilities

### Electric

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
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<tbody>
<tr>
<td>Tucson Electric Power/UNS Electric</td>
<td>(520) 571-4000 ofc.</td>
</tr>
<tr>
<td></td>
<td>(520) 623-3451 (outages)</td>
</tr>
<tr>
<td>Sulphur Springs Valley Electric Cooperative</td>
<td>(520) 384-2221 ofc.</td>
</tr>
<tr>
<td>Arizona Blue Stake</td>
<td>(800) 422-3275 (after hrs.)</td>
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<td></td>
<td>(800) 782-5348</td>
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### Natural Gas—UNS Gas

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<th>Service</th>
<th>Number</th>
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<tbody>
<tr>
<td></td>
<td>(520) 571-4000 ofc.</td>
</tr>
<tr>
<td></td>
<td>(520) 623-3451 (emergencies)</td>
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### Water Quality

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
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<tbody>
<tr>
<td>Arizona Department of Environmental Quality (ADEQ)</td>
<td>(888) 271-9302</td>
</tr>
<tr>
<td>Arizona Department of Water Resources (ADWR)</td>
<td>(800) 352-8488</td>
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## Wildlife

<table>
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<tr>
<th>Service</th>
<th>Number</th>
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<tbody>
<tr>
<td>Arizona Department of Game and Fish (AGFD)</td>
<td>(602) 942-3000</td>
</tr>
<tr>
<td>Phoenix:</td>
<td>(520) 628-5376</td>
</tr>
<tr>
<td>Region V, Tucson</td>
<td>(800) 352-0700</td>
</tr>
</tbody>
</table>
BI B I L O G R A P H Y O F P R I N T E D R E S O U R C E S

Amphibians and Reptiles in Arizona.  2006.  Thomas C. Brennan and Andrew T. Holycross.  Arizona Game and Fish Department.  Phoenix. AZ.  Photos, range maps, and natural history of herpetiles found in Arizona, along with descriptions of biotic communities.


Arizona Rare Plant Field Guide. A Collaboration of Agencies and Organizations.  Line drawings, photographs and habitat descriptions of many rare plants.


Cacti of the Southwest.  1963,  W. Hubert Earle.  Rancho Arroyo Book Distributor.  Tempe, AZ.  Key to identification of cacti, with photographs.


Plants of Southeastern Arizona is not a single volume, but a series produced by the Coronado RD & D Area, Inc., and Conservation Districts of Southeastern Arizona.  These are pocket sized, and include descriptions and general information on each topic group.  Also may be applicable to New Mexico and northern Mexico.

- Cacti of Southeastern Arizona (2006)
- Poisonous Plants of Southeastern Arizona (revised 2001)
- Summer Forbs of Southeastern Arizona
- Winter Forbs of Southeastern Arizona (2002)

Grasses of Southeastern Arizona
Shrubs of Southeastern Arizona
Crop Weeds of Southern Arizona (2008)


Weeds of the West.  Revised 1992.  Tom D. Whitson, Editor and Author, and others.  Published by the Western Society of Weed Science in cooperation with the Western United States Land Grant Universities Cooperative Extension Services.  Photographs and species descriptions of plants that often cause problems for land managers.