

## **ENVIRONMENT AND ENERGY ELEMENT**

An Environmental Planning Element is required in General Plans for all Arizona cities and towns of over 2,500 population, according to Arizona Revised Statute §9-461.05 adopted pursuant to the Growing Smarter Plus legislation. The Environmental Planning Element includes *analyses, policies and strategies that address the anticipated effects, if any, of General Plan elements on water quality, natural resources and air quality associated with development envisioned by the General Plan.* The policies and strategies included in this Element are required to have community-wide applicability, rather than focus on specific properties or areas of the Town.

An Energy Element is not required for towns with populations under 50,000, but is an option included in the Pinetop-Lakeside General Plan, recognizing the Town's concern with energy efficiency and sustainability. The Energy Element, as described in State statutes, includes: *policies that encourage and provide incentives for efficient use of energy and an assessment to identify policy and practices that increase use of renewable energy sources.*

The Environmental Planning and Energy Element is strongly related to other General Plan elements such as those dealing with land use, circulation, open space, growth areas and community services. It requires a look forward to the effects implementation of General Plan recommendations will have on the character and quality of Pinetop-Lakeside's environment.

The community survey conducted as part of the General Plan Update demonstrates the importance Pinetop-Lakeside citizens give to the Town's environment. Responses emphasize the desire for sustainable development; preserving the natural environment and retaining open space. This emphasis is also reflected in the Vision Statement proposed by the General Plan Advisory Committee (GPAC) which states a commitment to preserving the town's mountain heritage, friendly and environmental attributes for future generations to share and enjoy -- including opportunities for outdoor activities,

interacting with wildlife, and enjoying the natural beauty of our lakes, creeks, meadows and forests.

Both the *Town Plan* and *Linking Our Landscape* include a strong focus on sustainability and natural resources as key contributors to the Town's quality, character and economic vitality. They have enjoyed strong community support. The 2010 General Plan Update incorporates key findings and recommendations from *Town Plan* and *Linking Our Landscape* within the Plan elements.

#### *Town Plan*

The 2006 *Town Plan* included a broad look at Pinetop-Lakeside's natural environment, water resources and energy-related planning concepts. It identified potential issues related to encroachment by development on creeks, meadows, floodplains, riparian areas and lakes. It emphasizes the importance of streams, meadows and other open space as wildlife corridors and the need to protect these corridors as growth occurs. *Plan* recommendations address these issues as well as fragmentation of habitat, the need to include meadows in open space planning and the benefits of providing gradual edges, or buffers, between open space and development. Planning and design concepts are presented that may result in greater energy efficiency by encouraging walking, bicycling and transit use, mixed land uses and encouraging new development to take place in specified nodes.

#### *Linking Our Landscape*

*Linking Our Landscape* includes a detailed look at natural features and resources, water quality and related issues. Air quality and energy are mentioned, but not a primary focus. This study, completed in 2008, takes into account the findings and analysis of the *Town Plan* and presents recommendations for open space conservation.

## **I. EXISTING CONDITIONS**

*Linking Our Landscape* includes a wealth of information about Pinetop-Lakeside environmental and energy considerations related primarily to open space protection and management. The following draws from this information and other sources, as noted.

### **A. Water and Water Quality**

(Note: see also the Water Resources Element of this General Plan Update.)

The lakes and streams in Pinetop-Lakeside carry water that does not belong to the people but rather belong to the Show Low Pinetop Woodlands Irrigation Company. Flow rates and lake levels are regulated by the Irrigation Company.

Maintaining healthy water resources is important both to accommodating new growth and to Pinetop-Lakeside's scenic character and quality of life. Increased growth means increased demand and potential impacts on water quality. An expanding urban "footprint" impacts surface water runoff. Construction of rooftops, streets, parking lots and other impervious surfaces can increase runoff and flooding, compared to pre-construction conditions. To mitigate this effect, the Town requires detention basins as part of new development. These basins slow the discharge of stormwaters and can help to recharge groundwater.

Stormwater runoff from developed areas can result in water quality degradation. Water flowing across pavement, rooftops and other impervious areas moves and concentrates pollutants, sediment and other materials into the existing drainage system. In addition, runoff from lawns and golf courses that utilize fertilizers and other chemicals flows into the creeks, lakes and riparian areas. The degradation of Rainbow Lake was in large part a result of fertilization of the surrounding landscapes, in addition to the use of septic systems surrounding the lake. Protection of wetlands and undisturbed riparian areas can provide water quality improvement by filtering or assimilating stormwater runoff. Reduction in

impervious area through use of permeable paving or soil cement products can also have significant benefit.

## **B. Air Quality**

Air quality in Pinetop-Lakeside is generally excellent. The Town's website lauds the air as "pollution-free". The forests play an important role by providing a natural air filter for atmospheric pollutants. Absorbing carbon dioxide and producing oxygen and water, they also help reduce air temperatures. Smoke from wildfires and prescribed burns can negatively affect air quality and smoke hazard warnings are issued when conditions warrant.

## **C. Natural Resources**

### **1. Creeks and Lakes**

Pinetop-Lakeside lakes and streams are key attributes of community character. They provide the opportunity for recreation as well as habitats for wildlife. The water they provide made it possible for early settlers to irrigate their crops, an essential element for the founding of the Town(s). Lakes in and near the Town are man-made and were first built as reservoirs. Billy Creek and Walnut Creek flow through the town, roughly paralleling State Route 260. These creeks are proposed by the *Town Plan* for restoration and improvement as the framework for a Town-wide trail system.

Benefits of the lakes and creeks include:

- Recreational use – Fishing, boating, hunting, bird- and wildlife-watching, hiking, bicycling, picnicking and general outdoor enjoyment along the creeks and lakes are among the Town's greatest attractions for both residents and visitors.
- Flood control – Creeks and lakes are the recipient of stormwater runoff from the Town and surrounding forest. Even though the Town requires water detention improvements for roads and developments, the creeks and

lakes must absorb excess runoff. With their groundcovers and other vegetation intact, they help slow the water, filter out sediments and retain moisture.

- Water for wildlife – The wildlife population depends on water from creeks and lakes. Some animals live in or partly in the water, such as fish and amphibians. Eagles nest, roost, and feed near water sources. Migratory birds follow the water. The Pinetop-Lakeside area is a popular resting, nesting, and wintering ground for birds, located between the arid deserts to the south and arid lands to the north. Mammals such as elk and bear roam over large territories and need a variety of reliable water sources.

## **2. Riparian Areas**

Riparian areas are the narrow areas along creeks, lakes wetlands and springs that retain more moisture than the nearby forest and are critical habitat for over two-thirds of all Arizona wildlife at some point during their lives. Riparian areas filter runoff and vegetation helps stabilize banks and reduce erosion. These areas are increasingly rare and Pinetop-Lakeside is fortunate to have riparian areas along Billy Creek and Walnut Creek that are largely intact. It is important that these areas be protected as the Town grows.

## **3. Wetlands**

Wetlands are important ecological features that often contain standing water, such as Jacques Marsh Wildlife Area Wetlands help protect and improve water quality, store floodwaters, provide valuable wildlife habitat and recharge groundwater. Jacques Marsh covers 160 acres of National Forest land, including 96 acres of ponds, with seven ponds and 18 islands. The Marsh maintains and improves waterfowl nesting, feeding, and resting habitat using available treated effluent and provides hunting and educational activities.

## **4. Meadows and Grasslands**

Although the *Town Plan* expresses the concern that meadows are primarily seen as potential development sites, they are important natural resources. They provide a break in the forest cover where elk and other animals find needed food sources and serve as significant groundwater recharge areas.

## **5. Forests**

The ponderosa pine forest helps give Pinetop-Lakeside its character and attracts tourism. The forest is valued by the community for aesthetic, economic and ecologic reasons. As mentioned previously, the forest is a natural air filter and helps cool temperatures. Tree roots retain moisture and release it slowly during the year, helping to maintain flow in streams and other waterways. Forests provide habitat for hundreds of wildlife and plant species, with large mature trees, downed logs, snags, grasses and shrubs all playing their parts. Forest management and conservation can help reduce fire hazard while retaining essential forest character and quality.

## **D. Energy**

Navopache Electric Co-op and Unisource (natural gas) are principal energy providers in the Pinetop-Lakeside area. More remote locations utilize propane gas or wood-burning stoves for heating and cooking. Many residents that are served by gas and electricity also enjoy fireplace or woodstove alternatives.

There is some local interest in exploring alternative energy sources, although financial and physical constraints have limited experiments with demonstration projects pertaining to renewable energy. Many energy options are better suited to other locations.

Solar power generation has potential to augment more traditional energy sources for individual homes or businesses, but much of the community nestles in forests that block direct sunlight. Large arrays of solar panels assembled in open areas to achieve economies of scale would be regarded by many as detracting from the

scenic, natural quality of the Town's remaining meadows.

Wind farms are being developed in northern Arizona. One is in operation near Snowflake and another, contracted to supply Arizona Public Service, is planned north of Williams. Prevailing winds across flatter, open land are adequate for electrical power generation, but not in the central White Mountains.

Biomass power plants were thought to have excellent potential in the region, utilizing chips from forest clearance and wood products manufacturing processes. Operations have been considered in nearby Apache County (Springerville, Eagar) and Snowflake White Mountain Power opened a biomass power plant in mid-2008. The Snowflake plant, supplying APS and Salt River Project, has been beset by problems associated with performance and financing.

Numerous programs are offered by the Federal Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) to stimulate the national economy with clean energy initiatives. These include assistance to local governments ranging from expanded weatherization grants to community renewable energy projects.

## **II. ENVIRONMENT AND ENERGY ISSUES**

Awareness of possible future issues, such as degradation of air and water quality or diseconomic energy use, creates opportunities to be prepared for problem areas other communities have faced.

### **A. Water and Water Quality**

Located outside Arizona Department of Water Resources' (ADWR) Active Management Areas, Pinetop-Lakeside has limited water resource data and ADWR does not require developers to provide assurance of a 100-year water supply. The Town Council did consider enacting a 100-year water supply

assurance requirement during 2007, but chose not to do so at that time. The Town does not operate its own water utility. New development may compromise water supply and quality through increased groundwater pumping and runoff from new impermeable areas and landscape areas treated with chemicals. There is a concern that growth will bring a degradation in water quality, primarily due to runoff and loss of riparian areas that help filter it. The Town has very limited control of groundwater pumping or management of surface water in streams, creeks, riparian areas and wetlands. This water is managed by private irrigation companies for use by private property owners.

**B. Air Quality**

No significant issues were identified related to air quality. Although not likely to become a serious air quality threat in the White Mountains, the popular use of woodburning stoves may cause cumulative effects.

**C. Natural Resources**

Fragmentation and loss of open space, wetlands, riparian areas, grasslands and forest can, over time, result in degradation of clean and sustainable water supplies, flood control capabilities, stable soils and access to public lands.

Habitat, migration corridors, water sources and feeding areas for wildlife can be lost, so the animals move elsewhere. Introduction of exotic and invasive plant or animal species can do extensive ecological damage and be very costly to remove.. This can be an almost-invisible, incremental process of small decisions and developments that add up to change the basic character of the Town that people have come to value. Plans should be put in place to balance growth with preservation of the natural environment. The "node" concept presented in the *Town Plan* is a step in the right direction.

**D. Energy**

Energy "sustainability" is an important community focus, yet few people understand exactly what this means. It may mean those wiggly light bulbs to one person, a community garden to another and generation of energy through biomass conversion to someone else. A multi-layered education program is needed, which will involve staff and community volunteers. A community-wide energy audit has been helpful to cities and towns across the nation. In Arizona, activities have been conducted by municipal staff, energy providers and private sector professionals under the auspices of the Arizona Department of Commerce's Energy Office.

The benefits of green energy and building are also not clear to many people. There is concern about short-term and long-term costs, the viability of available technologies and whether or not alternative energy sources will really work. Professionals -- contractors, architects, landscape architects and utility professionals -- must be knowledgeable about the green alternatives and willing to give them a try. Green building and energy generation have great potential but are still seen as cutting-edge concepts.

The Town could take on a leadership role by designing public facilities or purchasing equipment that include energy efficiencies. Also, municipal government could participate in, or encourage local residents to consider, energy-saving performance contracts with companies that install energy efficiencies at no upfront costs, with payback to the contractor over time from cost savings.

### **III. GOALS AND OBJECTIVES**

Environmental and Energy derived from citizen General Plan Update participants include:

**Goal 1. Mitigate development impacts on water quality, air quality and natural resources.**

*Objective a:* Prevent degradation of air quality.

*Objective b:* Maintain, where possible, public access to surface water (including greenway/linear open space along creeks such as Billy and Walnut Creeks).

*Objective c:* Identify and preserve wildlife corridors.

*Objective d:* Manage stormwater runoff to prevent degradation of water quality and natural areas.

*Objective e:* Protect the ecosystems that provide habitat for wildlife, support native plant communities, assure good water quality, drive community character and provide educational and recreational opportunities.

*Objective f:* Connect the trails, greenways along creeks, meadows and other natural areas to create a linked open space system that benefits people and wildlife and connects with National Forest and tribal lands.

**Goal 2. Participate in forest stewardship responsibilities.**

*Objective a:* Coordinate with the U.S. Forest Service and other entities to assure environmentally-responsible trail access and use.

*Objective b:* Apply approved techniques (e.g., brush clearance, thinning, prescribed burns, "chipping") to prevent forest fires.

**Goal 3. Sponsor community-wide awareness of efficient energy use.**

*Objective a:* Lead by example with public facility demonstration projects.

*Objective b:* Promote energy conservation through public education.

**Goal 4. Consider developing appropriate alternative energy sources.**

*Objective a:* Encourage new energy technologies in public and private projects.

*Objective b:* Attract "green business" enterprises and green building.

*Objective c:* Evaluate biomass energy potential.

**Goal 5. Adopt energy conservation practices to improve efficiency and reduce costs for residential, commercial, industrial and institutional power users.**

*Objective a:* Participate in audits to evaluate energy use in municipal facilities.

*Objective b:* Revise development standards, where appropriate, to foster energy-efficient construction.

#### **IV. FINDINGS AND RECOMMENDATIONS**

A detailed study of the costs and feasibility of developing greenways along Billy Creek and Walnut Creek should be given priority. This study should include consideration of shared-use trails, linkages to future nodes and regional trails, access to neighborhoods, creek crossings and linkages to open spaces such as parks, meadows, forest and riparian areas. The need for creek restoration should be evaluated and recommendations given for any needed improvements. The study should actively involve all affected landowners.

Plans should be developed for a Town-wide open space system plan that incorporates concepts and recommendations included in the *Town Plan* and *Linking Our Landscape*. The open space system should provide a continuous network of greenways, trails, protected areas, accessible natural areas, urban trails, bicycle facilities and developed public spaces. The system should identify and protect wildlife corridors, fragile ecosystems and habitat while promoting educational opportunities and recreation where appropriate. The system should include linkages to the proposed nodes, to the regional trail system and to surrounding communities. The Open Space Committee should be involved in this effort to identify gaps outside the 25 parcels analyzed in *Linking Our Landscape*.

The Town should work with developers to identify and achieve community benefits through provision of meaningful open space as a fundamental element of their plans. Also, the Zoning Ordinance needs a broader definition of "open space" to include not

only developed or restored open space, but also meadows, streams, riparian areas, wetlands, grasslands and lakes. Incentives may be considered for transfer of development rights to protect especially sensitive areas or areas needed to complete the greenway/open space system. The amount of open space required as part of new development should be reviewed and adjusted as needed. If it is necessary, development incentives may need to be given in exchange for acquisition of or development restrictions on prime open space parcels.

Building from the foundation established in *Linking Our Landscape*, the Town should develop additional analytic and mapping documents addressing the Town's water systems, diversions and sources, special status trees, an in-depth environmental inventory and others.

Consider designating Town staff member and citizen advisory board to act as a primary contact and promote green building and sustainability programs. The staff member can study programs in other cities and towns to develop educational materials, presentations and employer incentive programs. Energy-saving strategies for businesses and residents can be developed and distributed, with Town facilities leading the way as demonstration projects. Develop a process for energy audits and make the audits available to businesses and residents, along with suggestions for improving energy efficiency.

Adopt a goal of Leadership in Energy and Environmental Design (LEED) certification for new public buildings. Evaluate the feasibility of providing incentives for private construction that achieves LEED certification in terms of expedited processing or flexibility in Floor Area Ratio (FAR) or other zoning standards.

Evaluate the costs, feasibility and potential energy output of alternative sources such as biomass, wind and solar technologies. Work with utility companies to set up demonstration projects, distribute information and educate the community about costs, incentives and benefits.