

GROUND FACTS

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Biodiversity on the Saturn Site

The Saturn Site is designed to fit the attractive local agricultural landscape. Most of the land use includes agricultural fields, fencerows, stream side forested corridors, ponds, and blocks of trees. These features comprise the habitat upon which the diversity of native plants and animals depend. The Saturn/UT Land Use Team, over the past few years, has attempted to set in motion several practices that should improve native biodiversity. The effort is meant to set an example of what industrial land management is capable of providing. This, in combination with programs of emission controls and waste recycling within the Saturn plant, is creating just that example.

LAND USE TEAM OBJECTIVES

- **Reduce use of chemicals, fertilizers, and maintenance**
- **Improve wildlife habitat for other than common native species**
- **Increase the amount of native habitat on-site**
- **Improve the arrangement of habitat across the site.**
- **Reduce the extent and effects of exotic pest plants**

Each of these objectives contains specific focus areas deemed most attractive for making the most progress at the least cost. In effect, the whole process is designed to reduce grounds maintenance costs for Saturn while achieving positive results that Saturn can use in marketing its cars as well as good land stewardship. Table 1 on the following page shows the relationship between these various environmental objectives and the actions taken by the Land Use Team. The relationships occur where the Xs are marked.

One of the challenges now facing the Saturn/UT Land Use Team is monitoring how the actions listed in the table are creating the desired changes. This is a challenge because the changes usually occur slowly and the indicators to measure may have other events altering them. Results from many of the indicators used need considerable understanding to interpret. For example, bird surveys have indicated little change in numbers or biodiversity. However, when the specific species are considered, there appears to be a slight increase in less common forest-oriented species at the expense of more common field-oriented ones. This is a desired change even though the overall biodiversity has not changed much. We cannot state clearly that outside influences were not the cause of this change since many birds fly in and out of the Saturn site.

INDICATORS for MEASURE

Bird censuses
Small mammal censuses
Tree seedling numbers and diversity
Exotic pest plant inventories
Quantity and type of herbicides and fertilizers uses
Grounds maintenance and equipment hours
Fish and macroinvertebrate inventories
Sightings reported by team members

Small mammal live-trapping was done along a streamside corridor near the farm pond to determine which small mammals were most active. The voles, shrews, and field mice were trapped using peanut butter and oats as bait. Before release, the critters were marked with red fingernail polish to determine which/how many were caught as recaptures. This proved to be effective and in areas of high cover density, the number of small mammals was higher.

Monitoring results on native tree seedling diversity has been mixed. In areas where the Land Use Team has been working for improvements, such as along selected stream-side corridors, the improvements are measurable although slower than anticipated. Although seedlings from nurseries have been planted to

improve conditions, recruitment of naturally occurring seedlings has been dominated by just a few very common species. For example, species such as witchhazel and hornbeam were planted and are prospering while increases in hackberry, wild black cherry, and black walnut have occurred naturally. Anticipated increases in species such as green ash, sugar maple, basswood, redbud, beech, oaks, and hickories are barely detectable and may be naturally slower to respond. We have planted nuts and seeds of some of these species in selected areas as an inexpensive way of getting nature started down the right path of habitat development.

On a similar note, exotic pest plant inventories are indicators for species most likely to be problems in this area. Privet, thistle, johnson grass, multiflora rose, honeysuckle, and ailanthus are some of the major exotic invasive species to control. Test trials were done along a fencerow and seemed to be 80% effective. It is difficult to determine how many native seedlings could also have been affected during control measures.

Perhaps indicators that need more attention are the herbicide/fertilizer use quantities, as well as grounds maintenance labor and equipment hours. These numbers are very difficult to gauge. On site, farming operations, Excel, Premier, and the Land Use Team are all responsible for some sort of chemical spraying. Although new land management practices help to reduce the use of chemicals, closer monitoring of this is planned. Grounds maintenance labor and equipment hours are also difficult to determine because of uncertainty between acres vs time to maintain. The actions we are now taking as far as converting turfgrass areas to native grasses will help to lower these numbers. And we are making a special effort to keep our numbers as accurate as possible.

Team member sightings of bobcats, rabbits, coyotes, deer, fox, and other wildlife are also on the rise. This can be a response to increased awareness of wildlife, gradual increases in wildlife since Saturn started managing the land, in response to Land Use Team efforts, or more likely, a combination of both. If you see some wildlife, please feel free to call and report it to us for our records at x5029.

**TABLE 1
ENVIRONMENTAL OBJECTIVES vs ACTIONS TAKEN**

OBJECTIVES	ACTIONS	Landscape with native species	Convert turfgrass to native grasses	Establish denser stand of native vegetation	Plant needed native trees/seeds	Widen stream side corridors	Establish sanctuary	Connect stream-side corridors	Rehabilitate eroded/wet areas	*Contributes to cost savings
Reduce use of chemicals and maintenance		X	X	X	X					X
Improve wildlife habitat quality		X	X	X	X	X	X	X	X	X
Increase amount of wildlife habitat		X	X			X	X	X	X	X
Improve arrangement of habitat						X	X	X		X
Reduce exotic pest plants			X	X	X					X
*Contributes to cost savings		X	X	X	X	X	X	X	X	

*** Cost savings may require 3 to 5 years to be realized. However, once reached, the cost savings are perpetual from then on. This long term savings justifies some up front investments in converting selected areas to natural habitat.**

Ground Facts is a monthly update on the application of new ideas to reduce grounds maintenance costs, improve aesthetics, and increase environmental benefits at the Saturn site. Work is sponsored by Facilities Maintenance at Saturn and the University of Tennessee in a partnership agreement. For questions or comments, please contact Karen Lorino at (931)486-5029; e-mail at KareELO@aol.com or Dr. Jack Ranney at (865)974-3938; e-mail at jwranney@utk.edu.