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WISCONSIN NATURAL RESOURCES

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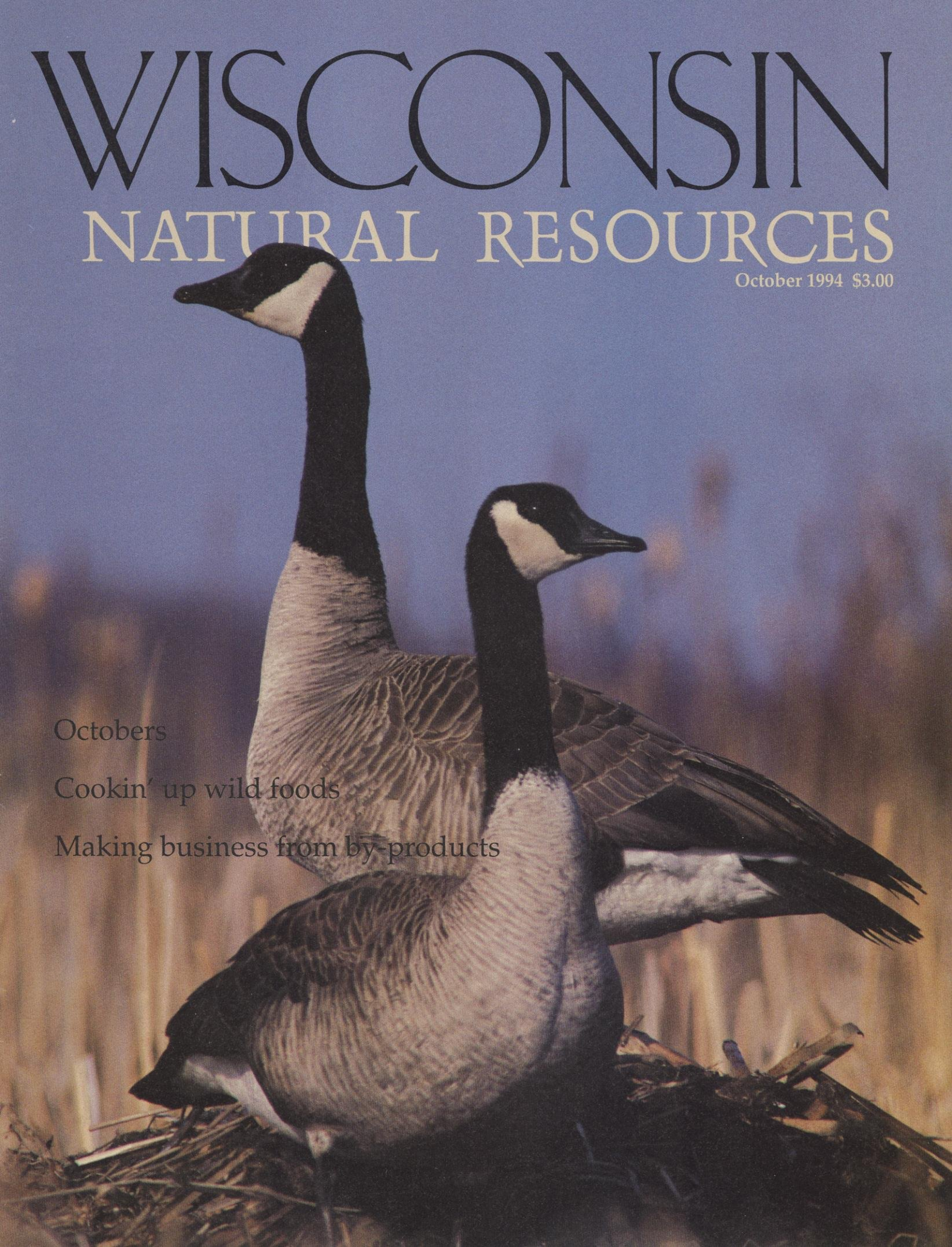

Octobers

Cookin' up wild foods

Making business from by-products

THE DOUBLE LIFE OF THE TAMARACK

TIMOTHY SWEET

Young tamarack needles.

Timothy Sweet

A glance out the window this time of year confirms that early October's rainbow of colors are gradually being replaced with more muted tones of brown, tan and gray.

By the end of October, the maples fiery brilliance has been scattered to the forest floor by persistent rains and blustery winds. The oaks deep burgundies, weathered to chocolate browns, stubbornly cling to sturdy branches. Copper beech leaves are becoming pale skeletons waiting to be stripped from their perches by a stiff November gale or a howling January blizzard.

Down in the lowland woods, the tamaracks stand inconspicuously among the hemlocks, balsams and cedars. They reach their finest hour in late October, turning a warm autumn gold after the leaves of most upland neighbors have long since faded.

The tamarack is a kind of duckbill platypus of the tree world. It is the only coniferous tree that behaves like its deciduous counterparts. Following a late-season blaze of golden glory, all of the tree's needles fall to the ground. Other needle-bearing trees like white pines shed some needles in the fall, but never lose all their needles at once.

Come spring, new tassels of tamarack needles will form in clusters of 10–20, each shooting out like water from a shower head. The soft, flexible needles are a beautiful blue-green color throughout the growing season.

Continued on page 31

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WISCONSIN NATURAL RESOURCES

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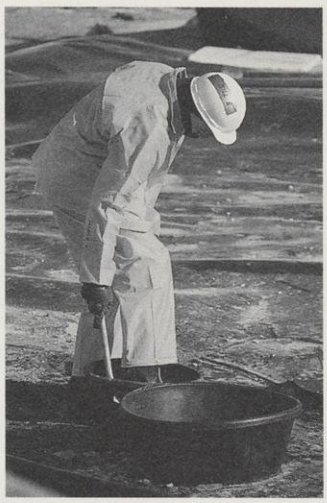
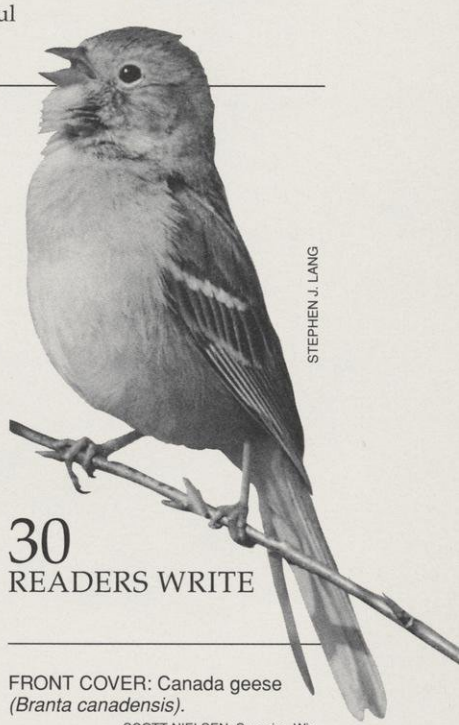

ROBERT QUEEN


STEPHEN J. LANG


E. PAULSON

FRONT COVER: Canada geese *(Branta canadensis).*
SCOTT NIELSEN, Superior. Wis.

BACK COVER: Rich fall colors of red oaks *(Quercus rubra).* See our story on the joys of October starting on page 23.
SCOTT NIELSEN, Superior, Wis.

ROBERT QUEEN

Neither a buyer nor a lender be

When contaminated land comes on the market, no one wants to be stuck with the cleanup bill. A new state law may help clarify who is liable.

Lee Hawkins

Commercial and residential land transactions have become increasingly complex due to a growing awareness on the part of buyers and lenders that what's underground, comes around. Consider the following:

- In the 1920s Harry Schuppe owned and operated Schuppe Mobil, a filling station that served Oshkosh when it was still a small community. Today, an abandoned gas pump marks the location of the old station. But the legacy of Schuppe Mobil runs much deeper.

In 1990, before the Schuppe estate was divided among the heirs, a man living near the property reported a strong gas odor in his basement. The

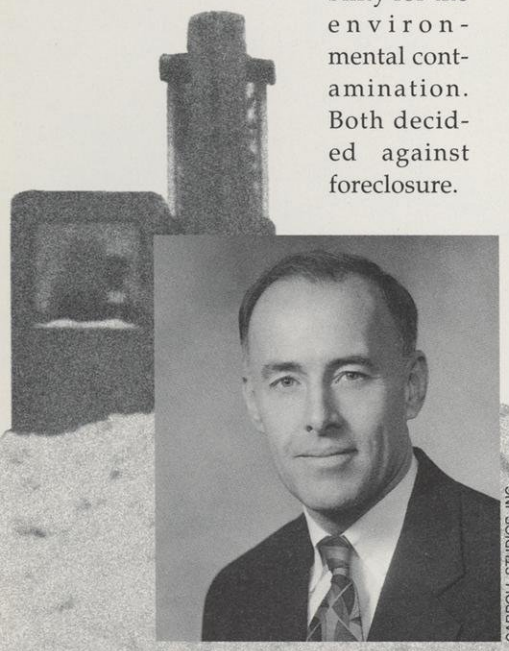
Out of gas. Who bears cleanup costs long after a business is gone?

odor was traced back to several leaking gasoline tanks buried beneath the Schuppe property.

Despite the fact that Mr. Schuppe died nearly four years ago, the legal woes brought on by the tanks have not been resolved. His heirs have not claimed or disclaimed their interest in the land, mindful of the fact that whoever claims the property would be responsible for a costly cleanup. For the same reason, the city of Oshkosh has yet to foreclose on the now tax-delinquent property.

- In another gasoline contamination case, in the late eighties the City of West Allis condemned a service station and was prepared to demolish the property. During an interim period in which the property owner was supposed to make financial arrangements to cover cleanup costs, he murdered his wife and took his own life as well. The couple owed a local bank approximately $77,000 and were behind in county tax payments by $32,500.

The bank and the county had two options: Absorb the loss, or foreclose on the property and assume liability for the environmental contamination. Both decided against foreclosure.



CARROLL STUDIOS, INC.

Tim Elverman

As these stories show, simple property transfers between seller and buyer belong to the heyday of Schuppe Mobil. Today, it's just as likely that environmental consultants, insurance agents, lawyers and government regulators will be at the table with lenders, buyers and sellers. At issue is not necessarily who made the mess, but who will pay to clean it up.

The lender's view

Prompted by rising concern over the cleanup of contaminated lands, in 1992 the U.S. Environmental Protection Agency drafted a lender's liability rule, which allowed lenders to foreclose on, hold and manage environmentally contaminated property as long as reasonable attempts were made to dispose of the property.

Challenged by the state of Michigan, the rule was knocked down in federal court. The court decision stated that the EPA lacked the authority to determine liability, and reserved that authority for the courts.

That decision, coupled with past rulings on lender liability, rocked the lending community.

According to Tim Elverman, an attorney with BancOne of Milwaukee who also served as an advisor to a special legislative committee on tax delinquent contaminated land, the court decisions forced banks to reevaluate their lending procedures. Many banks stopped offering loans on land suspected of contamination.

"Every parcel of property had to be treated as a potential liability," Elverman said. "We've had to require lengthy, expensive environmental assessments before lending on property. I can confidently say that the high cost of the environmental assessments did preclude many potential buyers from approaching us for loans."

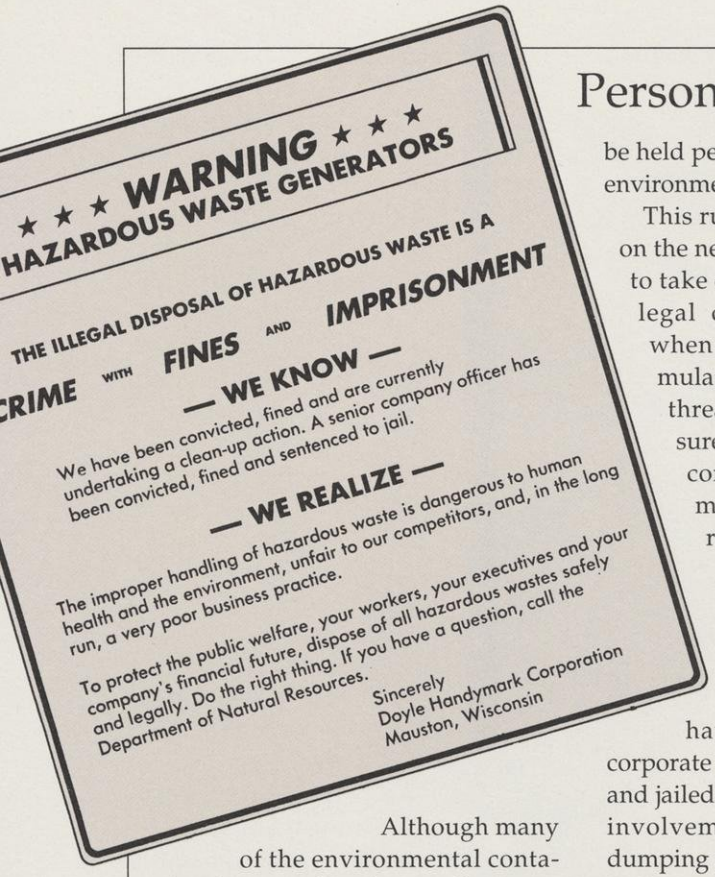
In April 1994, in an effort to get contaminated sites cleaned up, the legislature passed the Land Recycling Law. The law is designed to reduce or eliminate the financial liability of local governments in cleaning up tax-delinquent contaminated land. It also provides liability protection to lenders and certain purchasers of contaminated land.

"Simply being a lender should not make that party responsible for the cleanup," Elverman maintains. "Those previous decisions chilled lending activity. This new legislative action protects lenders, because we're only fulfilling our function of lending."

There are other options available to lenders. The bank holding the Schuppe estate has taken on the role of managing the environmental cleanup until Schuppe's heirs decide to settle their claims. The bank will be reimbursed by the Petroleum Environmental Cleanup Fund Act, a state fund offering financial assistance for leaking storage tank cleanup projects.

DNR lawyer Mil-

DNR PHOTO



Personal responsibility

be held personally liable for violating environmental laws.

This ruling places new emphasis on the need for corporate executives to take environmental factors and legal compliance into account when making decisions and formulating plans and policies. The threat of stiff fines makes measures to prevent environmental contamination equally, if not more important, than other routine business concerns.

If Doyle Handymark Corporation in Mauston had factored environmental liability into its business plan, things might have worked out better. The corporate president was fined $10,000 and jailed for 10 days for his personal involvement in a hazardous waste dumping pollution charge.

In a quarter-page newspaper ad, which ran in the Wisconsin State Journal and the Mauston Star-Times, the corporation stated: "The illegal disposal of hazardous waste is a crime with fines and imprisonment.

"We know — we have been convicted, fined and are currently undertaking a cleanup action. A senior company officer has been convicted, fined and sentenced to jail."

According to the Wisconsin State Journal, Juneau County Circuit Judge Wallace Brady imposed the fine and required the company to place the ad after finding the firm guilty of one count of polluting the city of Mauston's public treatment works by dumping a tank of a toluene-based solvent into the sewerage system.

Judge Brady also found Doyle guilty of "intentionally" filing a false report to the Department of Natural Resources stating that the firm had not generated hazardous waste.

Although many of the environmental contamination stories that make news involve leaking underground tanks, other kinds of contamination can render property unsalable. Spills of cleaners and chemicals used by janitorial supply contractors, auto repair shops, platers, electronic repair shops, even food processing plants can leach into soil and groundwater, accumulating over time. Orchards and golf courses mix and use pesticides on-site, which, if mishandled, can cause contamination.

Whether or not a property remains free of environmental contamination often depends on the business practices of the owners and tenants — a fact that prompted the Wisconsin Supreme Court to rule in 1991 that corporate officers or anyone who is responsible for the "overall operation" of a hazardous waste site can

Anticipating the need for long-term care can keep private property from becoming a public problem. Landfill site owners pay their way for 20–30 years after disposal sites close. Thereafter, the costs of monitoring wells and any remedial work are paid by fees that were collected when the landfills were open.

ROBERT QUEEN

Investigate present and past land uses before you buy property. For instance, pesticides were probably mixed, used and stored at small businesses like orchards, ag coops and plant nurseries. Would-be owners should review past business practices and examine the property before buying it.

ton Donald sees the Land Recycling Law as a step in the right direction. "This was a very positive move on the part of the State Legislature," Donald said. "Not only did the new law relieve tension for lenders in normal real estate transactions, it removed many of the fears lenders had concerning cleanup of contaminated property."

ROBERT QUEEN

New life for urban industrial sites

Crumbling factories and vacant lots scattered throughout Milwaukee, Superior, Green Bay and the industrial quarters of many other Wisconsin cities stand as reminders of a time when the true costs of pollution were largely unknown. Today those costs are felt all too keenly by the communities in which those dilapidated structures and empty spaces lie.

Laws have always required land owners to clean up land when contamination is discovered. Rather than deal with cleaning up leaking underground fuel tanks, metal filings, spilled sol-

vents, chemicals and other hazardous wastes, many urban industrial property owners simply refused to sell their property. They avoided informing the state or anyone else about the contamination on their land. They stopped paying taxes and let municipalities foreclose and assume the cleanup burden. City and county tax bases were drained. Courts were saddled with a backlog of tax-delinquent cases.

In many instances, it was cheaper for a business to build a new plant outside the city than to foot the bill for a lengthy environmental cleanup of unknown cost.

Businesses — and jobs — moved to outlying areas, contributing to urban unemployment, suburban sprawl, traffic congestion and air pollution.

The Land Recycling Law may help reverse this destructive spiral. Stated simply, here's how it works: When contaminated land is purchased, the new owner and the Department of Natural Resources come to an agreement about what needs to be done to clean up the site. If the cleanup is carried out as agreed, the new owner has no more liability for pre-existing environmental hazards.

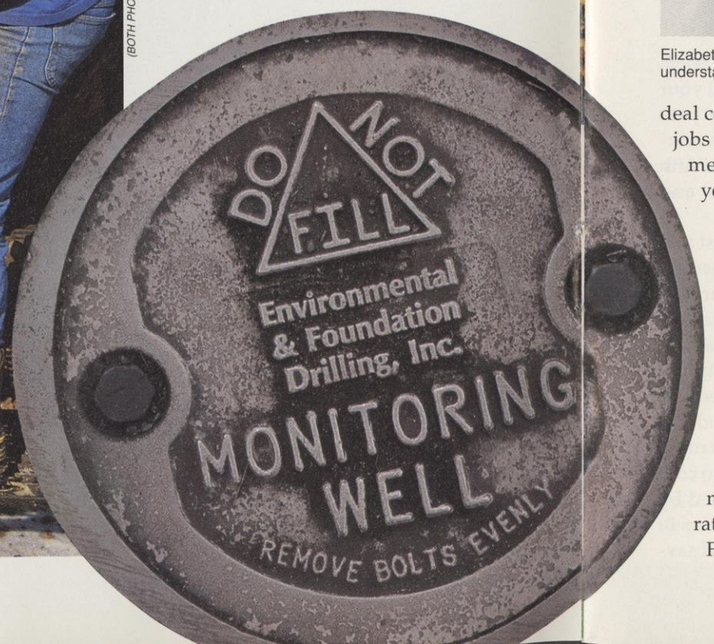
Should the cleanup become more expensive or extensive than originally planned, the state government and/or the former owners would cover costs.

Milwaukee County Treasurer Tom Meaux believes the legislation was long overdue, and says that having the statute on the books makes his job easier. "It's been a real hardship for a treasurer to deal with this," he said. "The legislation is not an end-all, but it is a tool."

The law has already sparked the purchase of a large urban industrial site. Wisconsin printer Quad/Graphics Inc. bought the old Giddings & Lewis plant in West Allis after the two companies and the city, county and state governments were able to work out cleanup responsibilities and future liability issues under the new law. The deal could bring 1,200 manufacturing jobs back to an area whose employment base has eroded in recent years.

The unseen costs in recovering contaminated land often include replacing water supplies, installing monitoring wells and testing groundwater quality for several years.

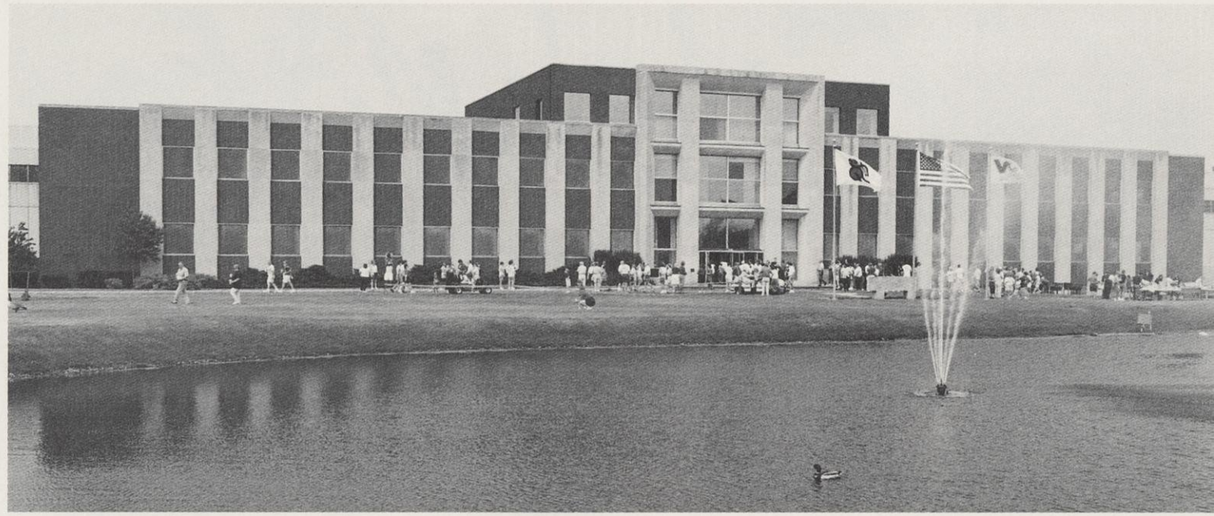
(BOTH PHOTOS) ROBERT QUEEN



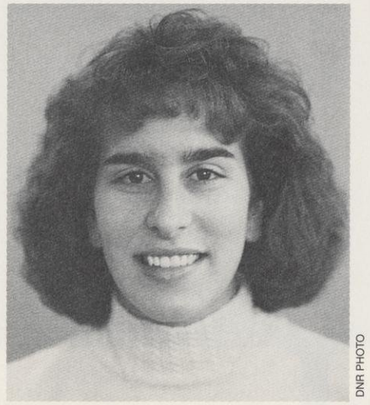
A cost of doing business today

Just as companies set up long-term investments to cover payroll and retirement funds, so must they begin to prepare for potential environmental liability. It's an issue affecting all of Wisconsin's economic engines, from large corporations to small businesses.

For the first 25 to 30 years of environmental regulation, agencies such as the Department of Natural Resources primarily dealt with big business. Now regulators need to attend to the waste produced by small business as well.



A recovery plan for aging, industrial corridors. The Land Recycling Law allowed Quad/Graphics to buy the Giddings & Lewis plant in West Allis. The deal could return up to 1,200 jobs to the area. After the manufacturing plant is cleaned up and refurbished, Quad/Graphics will have no future liability for the consequences of past pollution.



DNR PHOTO

Elizabeth Kluesner helps small businesses understand and secure environmental permits.

In January 1994, DNR Secretary George Meyer put together the Small Business External Advisory Committee, a group made up of nine small business owners charged with helping the agency improve outreach to small businesses.

Elizabeth Kluesner, DNR business permits coordinator, says the agency has made a conscious effort to fully understand the special financial constraints and other concerns unique to small businesses.

"We understand that a small pesticide company is not going to be able to have individuals on staff who are exclusively dedicated to environmental concerns as a Fortune 500 company would," she says. "Yet we are beginning to see more and more cases in which small businesses are affected by environmental contamination and costly cleanups."

Although some business owners are opting to hold on to land they would otherwise sell for fear of what an environmental auditor might find, smart sellers know that a clean environmental review can add real value to a property. And smart potential buyers, aware that the cleanup costs could exceed the property's value, are demanding environmental assessments of the land before negotiations begin.

"Liability for one's assets includes environmental responsibility," Kluesner says. "Small companies accustomed to weighing only the financial risk in proposed business and real estate loans now need to carefully assess their potential environmental liability before sealing deals."

To learn how the Department of Natural Resources will be implementing the Land Recycling Law, contact Darsi Foss (608) 267-6713 or Mark Giesfeldt (608) 267-7562 of the Emergency and Remedial Response program. □

Lee Hawkins is a DNR public information officer working on Clean Air Act issues in Madison.

Celebrate Trees

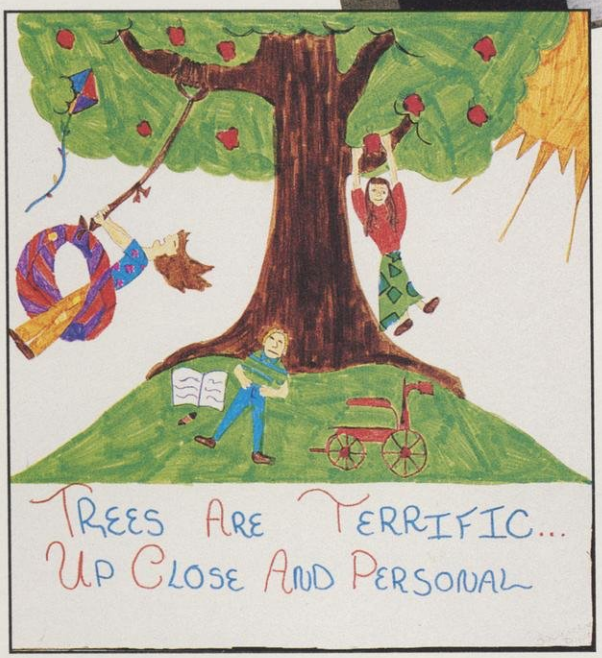
1993 second place winner by Andrew Sajdak, Greenfield, Wis.

Art and essay contest is a fun way to appreciate leafy, needly friends.

Truly, there may never be a poem so lovely as a tree, but don't tell your kids and grandchildren. Each year Wisconsin fourth graders are encouraged to sharpen their pencils and fifth graders to lift their brushes and crayons in artistic praise of trees.

The fourth grade essay contest and fifth grade art contest are sponsored annually by the National Arbor Day Foundation, cooperating state foresters, arborists and other tree organizations to give students an opportunity to express their feelings about trees.

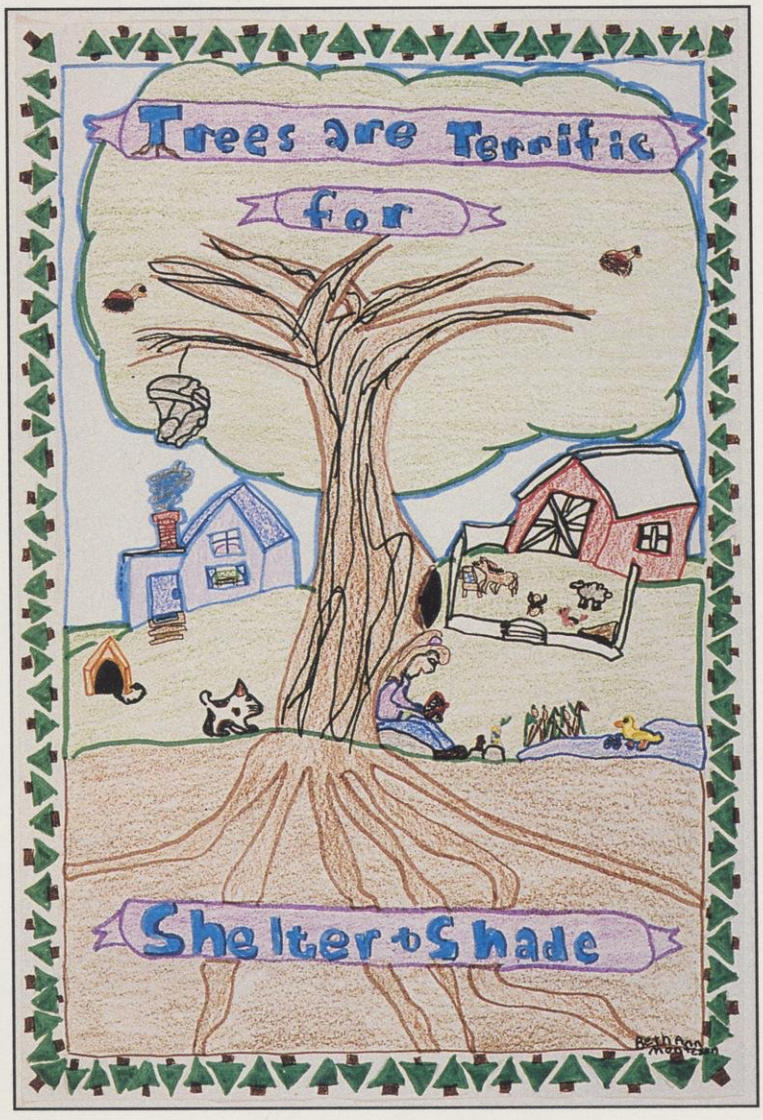
Each October, every public and private school in Wisconsin receives rules, guidelines and themes for the two contests. Entries must be submitted by early March. The top three winners in each contest receive plaques and sav-



(above) 1994 poster contest winners (l to r) Alicia Vang, second place; Jackie Dupre, first place; Racey Gasior, third place; received awards at the Governor's Mansion in Madison on Arbor Day.

(left) Jackie Dupre's winning entry.

(below) Beth Ann Montezon's artwork won third place in 1993.



ings bonds at a special ceremony at the Governor's Residence in Madison held on Arbor Day (April 24th in 1995). Winning entries from each state are forwarded for national competition to the arbor day foundation. National winners receive a savings bond and an expense-paid trip to the award ceremony at the annual meeting of the National Arbor Day Foundation.

For information about the fourth grade essay contest, contact Genny Fannucchi, forest appreciation specialist; for the fifth grade poster contest, contact Richard Rideout, urban forestry coordinator. Both work in DNR's Bureau of Forestry, P.O. Box 7921, Madison, WI 53707. □

LARDED BREAST *of* CROW

and other wild delicacies

Frances Hamerstrom has collected and kitchen-tested wild food recipes for almost 60 years.

AMHERST PRESS, PALMER PUBLICATIONS, INC.

Excerpts from a cookbook for wild foods from the fields and forests of the Great Lakes states.

Frances Hamerstrom

Editor's Note: We hope these recipes provide fun reading, if not haute cuisine. The second edition of Fran Hamerstrom's The Wild Food Cookbook *is available at bookstores and through Amherst Press, P.O. Box 296, Amherst, WI 54406.*

It was in 1935 that Frederick and I first encountered canned "weeds." Lured by the drumming of a partridge, we came upon an opening with a cluster of buildings even more tumbledown than the abandoned farm we had just moved into. An old, old couple invited us in.

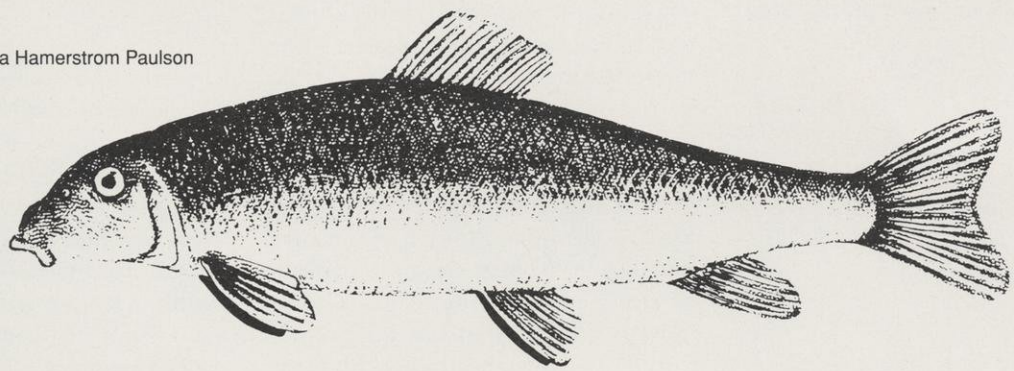
Time-polished knots stood high on the floorboard which creaked under our weight. Supper was cooking on the wood range. The walls had been carefully papered—layer upon layer of newspaper—"Keeps the cold out and brightens up the kitchen." There were two stools, two rocking chairs and in the dim recesses of the big room, a large brass double bed. Rows and rows of full mason jars packed with a pale greenish substance were tidily stacked under the bed.

"Them's fiddleheads," she said, "greens for winter."

Those jars of greens under the bed opened our eyes. We were hungry most of the time then, and we learned that it was possible to find food! That was long ago. Gradually we became better off, and the emphasis changed. We started eating wild food — not out of desperation as we had done during the Great Depression of the early 1930s — but because of their fantastic and unexpected flavors.

What follows is an introduction to a few of the tastiest wild foods in the Great Lakes states. Every recipe has been tested in our farmhouse kitchen or in camp — most of them over and over again.

Story illustrations by Elva Hamerstrom Paulson



Suckers

In spring, when the pasque flowers are in bloom and the first early buttercups are appearing, the suckers begin to puddle. They come to the shallows to mate. It's time to catch [and eat] them.

SUCKER PATTIES
(from Oswald Mattson)

The meat of suckers has an exceptionally fine flavor, but most people are discouraged by the many tiny bones. Just ignore these little bones when making patties.

Skin and clean the sucker. Cut the meat away from the major bones and run it through the meat grinder 3 or 4 times. Add about one-half as much cooked potato as fish meat and enough raw egg to hold the mixture together. Season with finely chopped or ground onions and salt and pepper to taste. Fry in a small amount of butter and oil.

According to [George Becker's *Fishes of Wisconsin*], the flesh of the blue sucker is firm, flaky, and well flavored. There are other suckers that are also good eating. Suckers are not easily confused with any unpleasant fish, so I eat any sucker I'm lucky enough to catch.

[For more on preparing rough fish for the table, readers might want to consult *A Fine Kettle of Fish* by Vern Hacker, published by the Wisconsin Department of Natural Resources in 1982 and still available from the Bureau of Fisheries Management for $1.95.]

Dandelions

The common dandelion, *Taraxacum officinale*, is a weed introduced from Europe. The Japanese consider the flowers so beautiful that they grow them in their gardens. We, on the other hand, grub them out of our lawns.

For eating, it pays to know when to dig them. Dandelions often live only two years. Those gathered in spring are frequently old and about to flower, set seed, and die. Few people know it, but dandelions are at their very best in fall when their leaf rosettes are storing foodstuffs—often for the only winter

they will know. They are worth trying in spring, but remember: Autumn dandelions are sweetest.

DANDELION GREENS

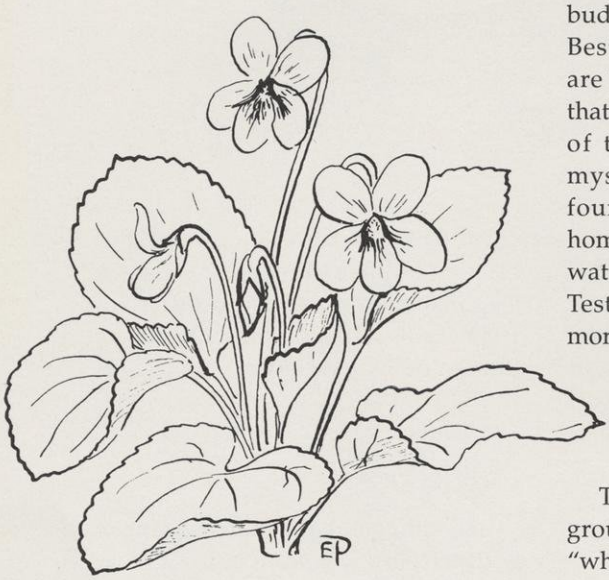
Boil tender young greens in salted water.

Violets

When I was a freshman, one evening my date handed me the first violet of spring. I looked at it, told him its Latin name and then I ate it. It was our last date.

As a child I had lived in Europe for a time and remembered opening boxes of expensive chocolates. Sometimes the top tray was sprinkled with crystallized violets.

All violets are good to eat. Blue violets are the most decorative when crystallized. Pansies are even prettier, but not quite as tasty.



CRYSTALLIZED VIOLETS

egg white
granulated sugar

Preheat oven to 250°. Beat one or two egg whites until stiff. Dip each violet in the beaten egg white, then roll each flower in granulated sugar. Put them on waxed paper in an oven at 250° until they are dry (about 10 to 15 minutes).

Crow

In some states (including Wisconsin) crows may be killed (by licensed small game hunters) whenever they are doing damage, or about to do damage. Crows doing damage are often eating corn and this should make them taste particularly good.

LARDED BREAST OF CROW

one skinned crow
several slices salt pork

Skin the crow and cut off the breast meat. Place in dripping pan, covered with thin slices of salt pork, and bake about 25 minutes at 375°. In the meantime, boil the legs, back, liver and heart for gravy stock or for soup.

Common Milkweed

Common milkweed, unlike most weeds, has a long "eating season." The tender young shoots are first-rate; the young leaves are good until they branch out and get tough. The flower buds are tasty too when they emerge. Best of all I like the pods when they are 1 to 1 1/2 inches long. I'm not sure that they taste better than other parts of the plant but they certainly do mystify company...especially when found floating about in a plate of home-made chop suey. Cook in salted water until tender (about 10 minutes). Test from time to time by sampling a morsel.

Woodchuck

The woodchuck, marmot, or groundhog — sometimes even called "whistle pig" — is really a squirrel.

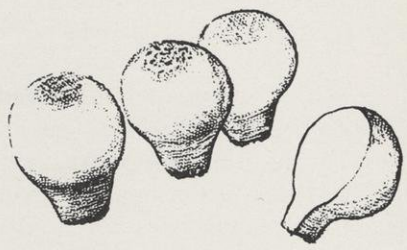
TO PREPARE

Dress out immediately. Skinning may be put off for a few hours if need be. Look for and remove the glands beneath the "armpits." These may give the meat a strong taste.

WOODCHUCK STEW

1 big woodchuck
5 sprigs mint
1 large onion
1/2 teaspoon ground clove
1 bouillon cube (beef)
Salt and pepper

Put back and legs in pot. This is about all the edible meat a woodchuck provides. Cover with water. Add salt, pepper, mint, bouillon cube, clove and sliced onion. Boil until water is almost gone. Remove bones and serve on toast.



Puffballs

Although there are quite a few species of puffballs, this group is one exception to the rule that one must know the species before eating. The beginner might mistake young, not fully formed mushrooms of other species for puffballs, but these, upon being cut open will not be homogeneous in texture and the stem within will be apparent.

Never eat a puffball if it is not evenly textured throughout and white — like a marshmallow — all the way through. Some are purple inside; avoid them. (The white ones turn cream colored, and then later dark brown and powdery with age.)

FRIED PUFFBALLS

Slice in 1/2 inch slices, dip in egg, flour lightly, salt, and fry until soft like eggplant. Tiny puffballs need only be cut in half.

Wild Grapes

Wild grape vines grow along hedgerows and often in rich woods. Aldo Leopold once suggested that quail covies could find excellent shelter if farmers simply cut down trees that supported grape vines. This is a

practical innovation not only giving quail security, but also making it easier for us to gather quantities of grapes within easy reach.

SPICED GRAPES
(from Carolyn Errington)

6 1/2 pounds grapes
3 1/2 pounds sugar
1 pint cider vinegar
2 teaspoons cinnamon
2 teaspoons cloves
1/2 teaspoon salt

Separate pulp of grapes from skins. Press the pulp through a food mill or strainer to eliminate seeds. (It is well to boil the pulp until it is soft to facilitate straining.) Make a syrup of sugar and vinegar. Boil 15 minutes. Skim. Add skins, pulp and spices to syrup. Boil a half hour from the time a full rolling boil is reached.

Acorns

According to [*Food Plants of the North American Indians* by E. Yanovsky, published in 1936 by the U.S. Department of Agriculture] the North American Indians used acorns extensively for food. "To remove the astringent and bitter principles, the acorns were dried and ground, and the meal was percolated with water until it tasted sweet. The sweet meal was prepared for food in many ways."

The white oak group (including bur oak) does not have bristles on the teeth of the leaves, and the acorns are good eaten raw like nuts.

The red and black oaks do have bristles on the teeth of the leaves, and their acorns are bitter requiring a good deal of preparation. One of the easiest ways of telling these two major groups of oaks apart is to taste the acorns. If they taste good, eat them.

WHITE OAK PATTIES

acorns
egg
a few tablespoons of fat or oil
salt

Boil dried acorns until soft. Drain and grind. (I use a meat grinder.) Salt lightly and mix with enough egg to form patties. Fry like pancakes.

DUCK JUDGING TABLE

BREAST CONTOUR	SKIN COLOR	SMELL	GRADE
 Pleasingly plump	Rich yellowish tan; fat under the breast skin	Clean, duck	Epicurean
 Rather normal; a touch of yellow	A touch of yellow	Duck, pleasant	Middling
 The nadir of wretchedness	Dull, greyish; little or no fat	Fishy or rank	Parboil
	If you have brought home a duck with an unpleasant chemical odor (pollution taint), pluck the handsomest feather, and bury the duck.		Bury

Ruffed Grouse or Partridge with Chanterelle Stuffing

Modern taxidermists have developed skills unknown in the olden days. So have modern cooks. This is about cooking: what to put inside a partridge to make it taste good. Partridge stuffing should be moist. An apple or an onion will do, but chanterelle stuffing is more delectable.

CHANTERELLE STUFFING

Fry chanterelle mushrooms slowly in lightly salted shortening until they are limp, rather than crisp. Stuff each bird with this mixture. (I have so often flushed partridges where the chanterelles grow that I've suspected partridges of stuffing themselves with these mushrooms!) The chanterelle is the famous "Pfifferling" served in Europe's finest restaurants. The Jack-O'-Lantern, similarly colored, is a spooky mushroom. I wouldn't eat it. It glows in the dark, but its reputation is such that — although it is not apt to kill you — I'd never stuff a partridge with it.

I might take a young one home, turn out the lights and hope it would glow for the children and me.

Staghorn Sumac

Sumac not only has magnificent scarlet leaves in fall to put in vases, it has other attributes: Its hollow stems are perfect to use for drawing sap from sugar maples (but that is another story).

I have never known sumac to grow tall enough to interfere with utility wires, but it is often sprayed, lest it might. We do not recommend sumac lemonade spiked with herbicides.

SUMAC LEMONADE

Fill 1/3 of a glass of water with the

dark red, velvety fruits of sumac. Squash them, strain through cheesecloth and drink an excellent lemonade. No sugar is needed. [Ed. note: but it helps.]

It is easy to tell velvety red fruits from the hard little ball-type fruits of poison sumac. Leave those strictly for the birds!

How to eat up a whole deer

With the present price of meat I shall dwell on orts (the parts that are usually thrown to the dogs) and how to recognize and not waste delectable trifles.

KIDNEYS OF THE HUNT BREAKFAST

(Dr. Wolf Dietsche)

For many years it has been a tradition that, after the long days of the deer hunt, friends gather at the Jugdschloss to swap stories — and to eat. There is always a special dish for breakfast. Preparation starts the evening before. Cut out each renal pelvis (the white, fatty area in each kidney). Slice each kidney in small slices, much as you would slice a banana. Wash the slices in three waters, drain them, and set them aside in a cool place.

4 kidneys
4 slices of bacon
1 onion (chopped fine)
4 capfuls of red, sweet vermouth (one per kidney)

Fry the bacon, add onion and sauté until golden brown. Add a capful of sweet vermouth per kidney and sauté the kidneys 3 to 5 minutes. You can see them turn color when done.

DEER TONGUE

Boil in salted water until the skin peels off easily. Serve with deer tongue sauce.

DEER TONGUE SAUCE

1/2 cup brown sugar
1 tablespoon flour
1 cup raisins (golden raisins are especially nice)
Salt to taste
1/8 cup garlic-flavored red wine vinegar
3/4 cup water

Mix dry ingredients, add liquids and cook to a syrup. Serve hot poured over the meat.

Opossum

The meat of these slow-moving mammals tastes rather like pork and "possum, pone, and sweet potato" is held in high esteem by many in the South. Some like their possums really fat and even hold them in pens to fatten them up for a feast.

Others consider the fat "greasy" and dispose of as much as possible of it before cooking. Possum meat is not especially popular in the northern states.

It is no trouble to distinguish between young and old possums at the northern limit of their range. All possums old enough to have lived through a winter got their tail tips frozen off; only the youngsters have gracefully pointed tips on their waving prehensile tails.

Roast like pork.

Taking liberties

Madame Kuony of the Postillion School of Culinary Art—one of the most respected academies in the world—says, "Creation comes when you know the rules. First you must know the rules; then you can take liberties."

Please take liberties!...If you always stick to the same recipe, and never vary it, each dish will taste just the way it did the last time you served it. "Just the same way" means it doesn't have a chance of tasting better than last time. □

Frances Hamerstrom is the author of 10 books for general enjoyment, and scores of technical articles and reviews in scientific journals. For 24 years, she and husband, Frederick Hamerstrom, managed a prairie chicken restoration project near Plainfield which earned DNR international acclaim. The Hamerstroms won the National Wildlife Federation's Award for Distinguished Service to Conservation for their work on prairie chickens, hawks and owls.

MAKING BUSINESS FROM THE BOTTOM OF THE BARREL

How Wisconsin firms are turning by-products into benefits.

Lisa Gaumnitz

Waste is a dirty word.

Just ask George Wornson. The Miller Brewing Company executive quickly corrects anyone who refers to the grains, yeast and carbon dioxide left over from beer brewing as "wastes."

"I call them secondary resources," admonishes Wornson, the company's secondary resources corporate manager. "You have to get people out of the mind-set of calling them wastes."

Lately, secondary resources have been anything but a waste for Miller.

In 1993, the company shipped more than $2 million of the brewer's yeast used in the fermentation process to soup manufacturers, pet food processors and pharmaceutical companies; it marketed barley and other grains left over from the cooking process as Barley's Best, a bran flour touted for its cholesterol-lowering qualities; and it incorporated wastewater from the tank washing process into fertilizer known as Farm O.N. The company also captured carbon dioxide released during fermentation and sold what it didn't use to a national firm that sells the gas to food processors.

> "You have to get people out of the mind-set of calling them wastes."
>
> *George Wornson*

All told, Miller's eight plants in 1993 earned $11.5 million from selling the by-products of their brewing process and kept all but three percent of the wastes they generated out of the

ROBERT QUEEN

Miller Brewing makes more than $11 million annually selling the by-products of beermaking including barley, yeast, wastewater and carbon dioxide.

Nothin' but niblets. Byron Enterprises, Inc. developed corn harvesting equipment for Del Monte that leaves two-thirds of the wastes in the field that used to go to the cannery. Husks, cobs and silk are ground and land-spread. Machinery now cuts the kernels off 560 ears of corn a minute. The process cuts waste and drastically reduced transportation, waste disposal and wastewater management costs.

landfill.

"It makes sense to do this stuff," Wornson says. "It's positive for the environment and it makes a financial contribution."

More and more, company executives are operating with that same mind-set. Spurred on by stricter environmental regulations (or the threat of such), a desire to appear environmentally-responsible, and rising disposal costs, many companies are reducing the amount of waste they generate and reusing what they do create. Shipping wastes to the landfill is becoming passé, and the search is on for ways to turn "secondary resources" into break-even ventures or even money-makers.

"We used to focus solely on getting the best leather out of every hide and sent our waste to the landfill," says Paul Erickson, vice president of environmental programs for US Leather, which owns the Pfister & Vogel and the A.L. Gephardt tanneries in Milwaukee. "Now we're redirecting some of that energy so we can foster some projects like this." He walks through a warehouse in north Milwaukee where waste shavings from leather hides are turned into adhesives and fertilizer.

Such changes in attitude are especially welcome in Wisconsin, which holds a large market share of the nation's business in food and animal products. California is king of the fresh market, but Wisconsin rules the canning shelves and freezers. We annually produce nearly 2.5 billion pounds of peas, snap beans and corn and must deal with the waste after harvest. Add to that the organic castoffs of other leading industries — papermaking, vines from cranberry processing and an estimated six million pounds of fish offal from commercial and sport fisheries.

Our wastes are largely organic — wastewater, and the by-products of plants and animals, which will naturally decompose over time with the help of microbes and the elements. That advantage is offset by the challenge of handling such materials quickly to avoid foul-smelling odors and vermin. Juice, or leachate, seeping from outdoor waste piles can contaminate groundwater or surface water.

Silage from sweet corn, for instance, produces 70 gallons of leachate per ton

COURTESY OF BYRON MIDWEST CORPORATION

of waste, "and is a very potent pollutant," says Jerry Rodenberg, chief of DNR's biological wastewater treatment unit. Corn leachate can be so high in nutrients that microbes need 200 times more oxygen to break down the waste than they require to decompose human sewage, he says. If leachate reaches streams and other surface waters, the oxygen demand would rob the water of oxygen that fish need to survive.

Vegetable wastes

Concern about such leachate, in fact, prompted new regulations for storing organic wastes and managing them into the 21st century.

For decades, companies contracted with farmers to take the corn cobs and husks, the pea vines and bean stems left over from processing. Farmers stockpiled wastes, let them ferment into silage for livestock feed, or spread decomposed wastes over farm fields to enrich the soil, Rodenberg says.

"We didn't have any regulations and some people were just putting the residues in gravel pits," he says. They recognized its value as cattle feed, but weren't managing it very carefully.

Corn silage stacks grew into 20,000 to 40,000-ton mountains, and the Department of Natural Resources reported several cases of groundwater contamination in the late 1970s and 1980s. In one case, up to 1.5 million gallons of leachate drained from a storage lagoon in the Town of Koshkonong in Jefferson County, contaminating two private wells. The farmer had to pump water from the contaminated wells to keep silage juice out of other wells and Lake Koshkonong wetlands. In another case, leachate from a corn silage stack in Grant County leaked into Leggett Creek, killing fish and boosting ammonia concentrations to 65 times acceptable standards.

Such incidents helped convince legislators that food processing wastes needed to be controlled. Since July 1990, all lagoons, tanks and storage structures had to be designed and operated to protect state waters from food processing wastes. Systems grandfathered in have until next July to meet the requirements. The law also limits how liquid wastes, solids and sludges can be spread on land.

> "With new technology, we can leave two-thirds of the vegetable wastes in the field that we used to haul to the processing plant."
>
> *William Spain*

Tough rules spurred innovations by vegetable processors, particularly those who can and freeze sweet corn where up to 70 percent of what is hauled in for processing must be hauled out as waste.

Improvements in harvesting allow some processors to leave more plant waste in the field, Rodenberg says. Pea growers used to cut whole pea vines and bring them to the processing plant where the pods would be threshed. "The new technology shells out peas right on the spot, so pods and vines stay on the field and are plowed under," he says.

This harvesting season, Del Monte Foods plans to harvest some corn for its Arlington plant with three machines that cut the kernels off the ears in the field and eject the plant wastes out on the ground to be plowed under, says William Spain, Del Monte Food's vice president, research, government and industry relations.

The machinery cuts the ears off the stalk, husks each ear, flips it so the ends all point in the same direction, cuts the edible kernels off 560 ears a minute and conveys finished corn to a hopper that has to be emptied every half hour. With this technology, Del Monte can leave two-thirds of the waste in the field that used to be hauled to the processing plant, Spain said.

Environmental benefits are a bonus of Del Monte's goal to cut transportation costs, cut processing costs, reduce labor and handle less waste, Spain noted.

The machine is somewhat of an anomaly in the industry. Most vegetable processors still landspread wastes or sell wastes for livestock feed.

Some food processors are rediscovering that composting techniques can cut wastes. A Kenosha company, Kin Works Inc., takes spent cranberry hulls from a nearby Ocean Spray plant and mixes them with duck droppings from Maple Leaf Farm Inc. in Franksville to create compost.

Work by the UW Sea Grant Institute in the mid-1980s to compost fish wastes from Door County's commercial fishers and resort trade has also served as a model. Lab and field studies found that fish wastes could be mixed with wood chips in carefully constructed piles. The fish waste com-

pletely decomposed in three weeks and the wood chips broke down into marketable compost within a year, according to researcher Lynn Frederick, a former Sea Grant field agent.

Bush Brothers & Co., a vegetable processor and baked bean canner, will test similar composting methods. Company officials hope composting is the solution to its $20,000 a year bill to dispose of stems and hulls trapped on the screens of its bean and pea processing equipment, says Brian Strauch, purchasing manager and environmental affairs. The company recently received a temporary permit to compost vegetable wastes with wood chips, Strauch says. "In a year's time we expect the process will break down pods and stems so farmers can spread compost on their land," he said.

The company already removes 40 percent of the moisture from its waste beans and sells the residue as cow feed. "Two days of running the machine will take care of the wastes we generate in a week," Strauch says.

Innovations to cut disposal costs create other environmental issues. Gretchen Wheat, DNR solid waste plan review engineer, notes that compost operators must curtail odors, watch contamination from leachate seepage, curb erosion and stem vermin. "They have to realize that if they are going into composting, it's something that has to be maintained," she says. "If it's not, you get all the same problems you can get with materials that are landfilled."

Processors are using other methods to dispose of liquid washes from cleaning and canning vegetables. Motorists travelling U.S. Highway 151 outside Beaver Dam probably don't realize that the lush green fields they are passing comprise the wastewater system for Pillsbury's Green Giant plant.

"From the road it's very aesthetic," says Dennis Guse, the plant's maintenance manager.

A set of four irrigation systems stretch across the fields and slowly roll around fixed pivots. During the mid-June to October harvest season, the system can daily spray fields with 850,000 gallons of wastewater that Green Giant generates from washing and canning 900,000 pounds of beans a day, and freezing 25,000 pounds of corn on the cob an hour. A partner in the venture, Badger Cold Storage, sends an additional 200,000 to 300,000 gallons a day to the irrigation system, Guse says.

The field is planted with a grass because wastewater cannot be legally sprayed on crops meant for human consumption. A farmer pays the company to crop the grass two or three times a year, Guse says. Equipment at the plant, the farm pumphouse, and groundwater monitoring wells gauge the nitrogen, biochemical oxygen demand (BOD), and chloride levels, Guse says.

Similar spray irrigation systems are used by nearly all the major processors in the area, but Green Giant's system is unique because of its cooperative arrangement with Badger Cold Storage, says Dan Heim, department land disposal system specialist for DNR's Southern District.

> "They have to realize that if they are going into composting, it's something that has to be maintained. If it's not, you get all the same problems you can get with materials that are land-filled."
>
> *Gretchen Wheat*

Department of Natural Resources officials say they are encouraged by the improvements. Environmental problems from vegetable processing have dropped off dramatically since 1990, says DNR's Rodenberg. Wastewater from processing vegetables hasn't caused significant groundwater problems since then."Most of the minor problems are caused by broken irrigation pipes or discharges directly into a wetland or stream.

"The trick of spray irrigation is having the right sites, continuously monitoring equipment and maintaining control over application rates," said Steve Sisbach, DNR environmental specialist.

Tanning industry

In Milwaukee, the specter of stiffer environmental regulations and international competition are driving tanneries to improve their waste-handling techiniques. The industry that has been shaken — and shrunken — by cheaper overseas labor and high domestic hide prices.

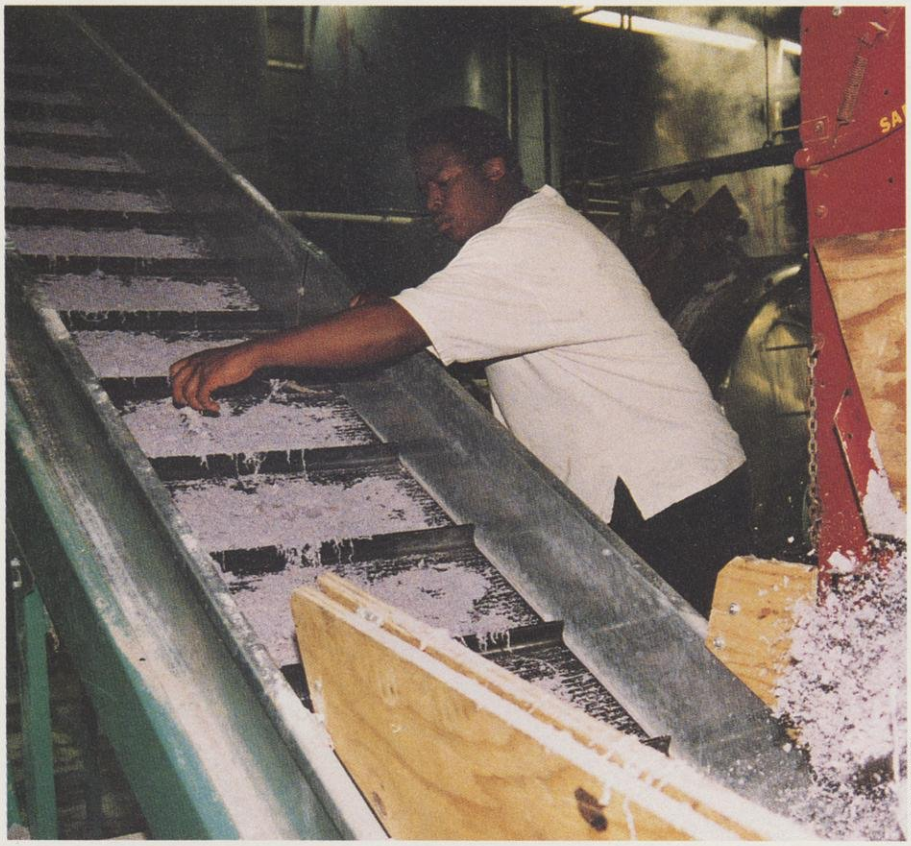
Paul Erickson, of US Leather, says the surviving American tanneries like his are "trying to get ahead of the game" by developing new markets for leather shavings. About 50,000 tons are generated a year in the United States, most in Milwaukee. The EPA has a tanner's exclusion that allows shavings to go into industrially regulated landfills. But Erickson predicts regulations and prohibitive landfill fees will close that option.

US Leather will be ready when that day comes. Erickson, a chemical engineer, used DNR grants to work with the Milwaukee School of Engineering faculty to develop new products.

In a warehouse on the city's north side, blue shavings heaped up in a silage wagon are fed through a grinder and up a conveyor belt. The scraps drop into a reactor where lime and liquids transform the leather bits into a gooey mass of simple proteins that look like melted caramel.

The process recovers chromium used to tan hides, and an amber liquid that is sold to adhesives manufacturers. A powdered form of the liquid can be used as a nitrogen enhancer in fertilizer.

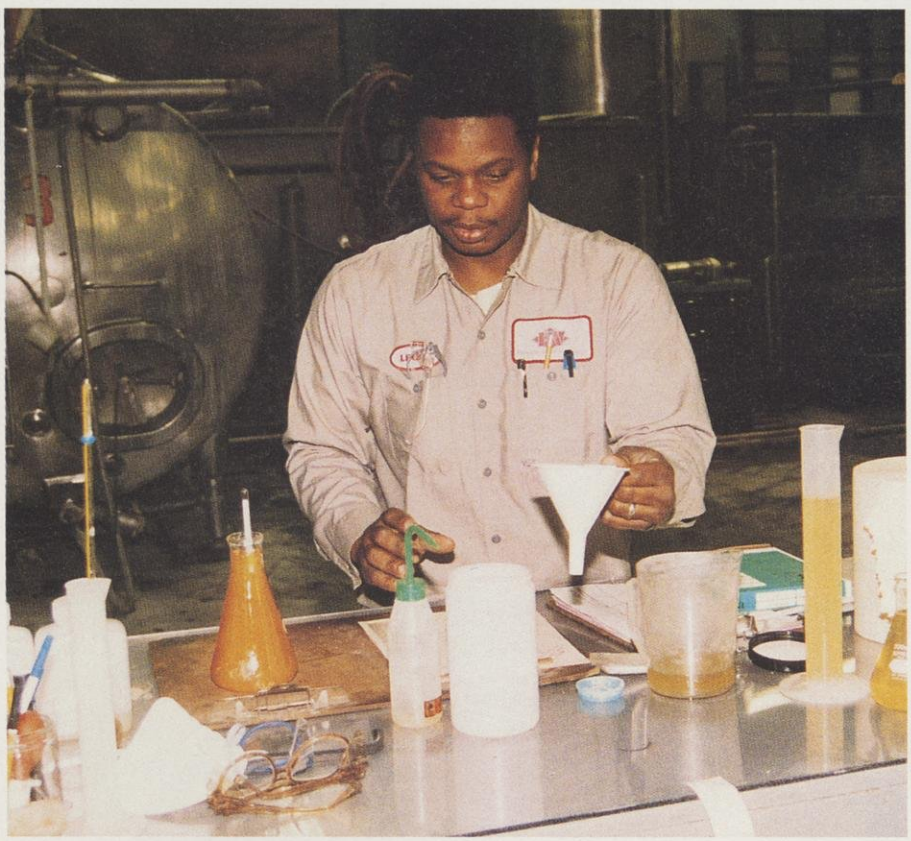
The invention allows Pfister and



ROBERT QUEEN

(above) Ground scraps and shavings from leathermaking are fed into a vat. Chromium, used to tan hides gives the raw leather a bluish color.

(bottom) The protein-rich scraps are digested with lime and liquids and heated. Chromium can be recovered and reused from the liquid mass. The caramel-colored goo is used to make hide glues or dried for fertilizer.



ROBERT QUEEN

Vogel tannery to turn the 8,000 pounds of shavings a day into 1,440 gallons a day of concentrate, and 200 pounds of chromium that can be fed back into its tanning process.

"The beauty of it is this is not a very chemical process, and it's very energy efficient," says Erickson. Now, the process is about a break-even venture.

P & V will increase capacity to take on shavings from the Gephardt tannery. "The great thing about innovation is, if you have a problem here, somewhere in the universe there's a solution," Erickson says. An earlier problem of separating clumps of shavings was solved by using silage choppers developed for farming. "To stay creative, we had to look broadly enough and adapt what we found," Erickson adds.

> "To stay creative, we had to look broadly enough and adapt what we found."
>
> *Paul Erickson*

Across town, that same philosophy helped Miller Brewing develop the technology and markets for its by-products.

If we had just said "We're in the beer business. Let's just get the beer out," we would have limited ourselves, Wornson says. "You have to look broader and best utilize all the resources you have. In the long run, the ones with a little broader mind-set may do better." □

Lisa Gaumnitz is a science writer who interprets environmental issues and policies for DNR's Bureau of Information and Education in Madison.

When an odor becomes a pollutant

ROBERT QUEEN

Zoning is a key to separating homes from odorous businesses.

A fowl smell finally did in Netex Pet Food.

The stench from its chicken and turkey rendering plant offended the senses and sensibilities of so many Eleva, Wis., residents that the Department of Natural Resources requested a temporary injunction back in 1983 to halt operations at the factory.

"Literally, people would throw up in the streets," recalls Tom Woletz, the Western District air management engineer who had determined that the odor from cooking feathers and fowl offal was "objectionable." When the judge granted the injunction, the company chose to close for good rather than invest in equipment designed to control the odor. Woletz was hailed as a hero in most quarters of Eleva, a villain in others; 40 jobs were lost.

The case was a rarity in the annals of Wisconsin's odorous cases — most are resolved long before the legal stink reaches courthouse doors. Controlling odors is a complicated affair for regulators and manufacturers alike because the offender's "crime" is an offensive smell.

In general, we don't assume that every unpleasant odor causes a health problem, says Dean Packard, chief of the compliance section of the Bureau of Air Management.

Odors are not air contaminants by definition. They are a property of a substance that can be measured only through its effects on the human nose. "The only real tool we have to use is our nose," Packard says. And noses can be pretty subjective.

There are no numerical standards by which an investigator can measure an odor to determine when it is objectionable. People have different sensitivities to odors, and what smells good to one person may cause a neighbor to turn up her nose.

Ambrosia Chocolate in Milwaukee, for instance, had only two odor complaints lodged against it in 1992, and one in 1993, according to DNR records.

Wisconsin statutes give investigators two tests for determining whether an odor violates state laws and is deemed objectionable:

- if DNR investigators decide the odor is objectionable based on its nature, intensity, frequency and duration.
- if 60 percent of a random sample of at least nine people exposed to the odor in their home or work place claim it is objectionable and the nature, intensity, frequency and duration of the odor are considered.

Packard says investigators rely on the random sample test more frequently, and have introduced its findings into court. Woletz used a survey to help him rule in the pet food case; 85 to 90 percent of those surveyed found the odor from the rendering plant objectionable.

DNR officials typically wait until they receive complaints before taking action as odors rarely pose threats to human health or the environment. In 1992–93, Wisconsin residents filed more than 300 odor complaints; more than 120 of these from southeastern Wisconsin, and about 70 from the Madison area, which recorded the second highest total.

Complaints range from the odor of burning leaves to the smell of paint, to the stench from slaughterhouses, DNR records show. Most odor sources are industrial — from solvents, papermaking, cheese factories and meatpackers. Agricultural sources accounted for only 11 complaints during 1992–1993, indicating that the increasing number of rural homes hasn't necessarily increased conflicts between ag industries and their new neighbors.

After receiving a complaint, DNR officials work with the people responsible for the odor's source to remove the source, change methods of handling and storing odorous materials, or use technology to solve the problem.

Increasingly, companies are putting "scrubbers" in their emissions stack to reduce odors. Scrubbers use water to cleanse the air, similar to the way rain removes dust and freshens the air, Packard says. Typically, scrubbers are located in the bottom of the stack and spray the gases that cause odors with water and a chemical. The chemical oxidizes the odor, and water vapor left over from the process escapes and condenses, forming the white clouds often seen billowing from some stacks. Some companies are marketing systems that funnel odorous gases through underground pipes into beds of soil.

"Technology can solve most odor problems, but its not always easy, cheap, or reasonable to apply," Packard says. "It's easy to control the first 90 percent of something, but for the next 10 percent, the cost starts doubling every few percentage points."

The key to preventing odor complaints, however, is good land use planning. Many of those problems arise when communities fail to establish a buffer zone between residences and industrial or agricultural uses. "We see more problems from poorly sited commercial property and industry than anything else," Woletz says.

OCTOBERS

Bob Willging

For me there is no other month like October.

I like its transitions. In the midst of October a glance back recalls the dog days of late summer, a short look ahead will bring snow that sticks and a rim of ice on the lakes. You have to maintain a sense of compromise. Days when the wind howls and the sky is streaked with ice are tempered by warm breezy days with crystal-blue skies.

Pattison State Park on the Black River. SCOTT NIELSEN

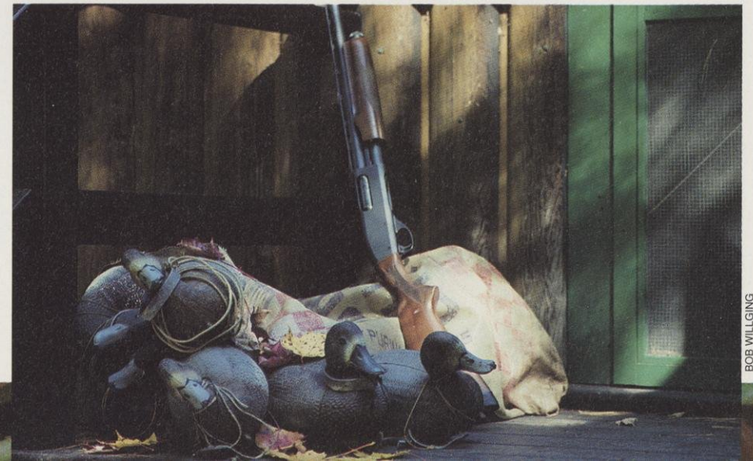
I remember a perfect October afternoon many years ago when I shot my first partridge. From the edge of an old logging road in the Chequamegon National Forest, two grouse flushed about 20 yards in front of me. The first zipped into the aspen before I could react. The second flew down the trail a bit before following the other into the trees. When my first shot finally sounded off, amazingly the bird dropped.

Even more than the bird, I remember the feelings, the colors and the smells. I walked a few more trails and stopped at the edge of an aspen clear-cut. The air was crisp and pure. The western sky was still full of red, orange and hints of pink as I also watched a yellow full moon start rising into a darkening sky. In the fading light, the nearly bare aspens and scattered firs were all detailed and crystal clear. By the time I got home, it was dark. Within an hour the bird was frying in the pan and woodsmoke was in the air. Magnificent, and only in October.

I've lived Octobers in places such as Texas and New Mexico. Knowing that the northern Wisconsin fall was happening when I wasn't there was a hard, cruel thing. One unusually chilly October night in Las Cruces, New Mexico, I caught the scent of woodsmoke. For a brief moment I was transported to the headwaters of the West Fork of the Chippewa River where I knew the bright yellow popple leaves were beginning to carpet the ground and the bucks were beginning to feel the rut.

You have to keep your sense of humor when gambling on October. Three years ago I spent a week in mid-October camped on the shores of a small lake in Bayfield County. I had hoped for a few days of clear, good weather so I could beat the brush for partridge. Instead, I got low rolling clouds that pelted me with a mixture of ice, snow and a freezing wind that numbed my hands and face. On the worst day, I was surprised to put up six grouse and a woodcock on a short stretch of trail. I only bagged one of the partridge and was more than

Back porch dekes await a fall hunt.



BOB WILLGING

SCOTT NIELSEN

Even when the weather turns fickle, it's beautiful.

happy to get back to my truck to thaw out my fingers. The next day I packed up and headed home. Twelve days later northwest Wisconsin was hit by the Halloween Blizzard that dumped more than three feet of snow in parts of Douglas and Bayfield counties.

October provides the first excuse to start wearing my heavy, comfortable clothes again. My cold weather clothes fit me the best. They are well worn and full of purpose. Digging out those old clothes feels more like a reunion than a change of wardrobe. Flannel feels warm and satisfying before the encumbrances of deep winter — long underwear, heavy socks, jackets and gloves — are needed.

Everything seems to come together in this month. The weather is right. The woods feel right — free of tourists and mosquitoes. Most hunting seasons have opened or will open before the month is out. It is the time up north when the dominant bucks become solitary, aggressive animals. Hormone levels surge, and rubs and scrapes just appear in the deer woods. The mix of woodsmoke, fire-red maples, heavy frost, birds, deer, crisp leaves and crisp air get to me. Unfortunately too many Octobers days are spent on the "necessities" of earning a living or maintaining a business. Enjoy the outdoors in the fall, and leave your work for a warm day in March or a cool night in June. Much too soon, the last traces of October will be covered by early snows. □

Bob Willging writes from Rhinelander, Wis.

A little bird told me so

Mary K. Judd

I suppose if we were birds, finding our way through the woods would be much easier. We'd just rise above the trees, set our sights on our destination, and head straight for it. Since we're not airborne, we navigate by known routes and landmarks.

What landmarks do we typically use in wood and field? Well, if you travel a place often enough, you start to name the unusual rocks, the streams and trees. On our place, my husband and I talk about parcels that are a certain distance from the "Sister Oaks", down the "Mayapple Path" or just past "The Hawk Tree." When you're tramping or hunting some other place for the first time, you really should go with someone who knows the lay of the land, or at least you should carry maps and a compass. Otherwise, your confidence in trekking and then retracing your steps will depend on your powers of observation. It helps if you can make the natural landmarks seem more distinctive. Let me describe how this method of navigating by nature helped me on a recent outing.

A naturalist and hunter thinks about getting lost in the woods.

I was turkey hunting last spring, and I hadn't seen or heard a bird after 90 minutes at my stand. I couldn't sit still any longer. So I pulled up my decoy, packed my assorted box and diaphragm calls, pocketed my shells, and set off in search of turkey sign. As I walked along, I remembered what the hunter who had recommended this area of the Baraboo Hills had said: "Take along a compass. You can easily get twisted around on the many branches of the logging trails."

I reached this point in my reflections when the trail I was following dead-ended. Of course, the one piece of equipment I couldn't locate when I had packed the night before was my compass.

I kept going.

With no artificial aids to guide me, I started mentally mapping the landscape. As I walked, I kept rehearsing the path I had taken: Take the ridge south (or what I thought was south) to its base. Turn left at the remnants of an old farm fence marked with large yellow private property signs. Follow the fence south to the next ridge. Follow that ridge's spine to the large forked white pine. Drop down to the huge fallen log in the ravine. Climb up to the next ravine. Follow the rock outcrop to the worn spot where people slid down to the wet area below, and so on.

As I write this, I realize I was actually keeping a visual record of my path rather than a verbal one. I stopped and turned around every time I passed a new landmark, because the landscape can look very different in reverse.

I was doing okay, but the farther along I went, the more uncomfortable I became. Educational theory tells us that people only remember about seven chunks of information at a time. I was up to nine, and it was getting hard to remember the

The minstrel of the meadow, a field sparrow, can mark your path.

STEPHEN J. LANG

sequence of landmarks. Moreover, one ridge or white pine was beginning to look much like another.

When I came upon a logging trail, I relaxed a bit. I noted the pattern of trees where my path intersected it and started walking down the trail.

Since turkeys were conspicuously absent, I started concentrating on the beauty of the limestone ledges, the spring ephemerals, and the windswept, weatherworn pines. I stopped hunting for one species and started looking at all of them...that's when I heard the song.

It was out of place — a song to be sung in a meadow or corn field perhaps, but definitely not in deep woods. It consisted of a single repeated phrase of notes that came ever faster, like a ping-pong ball dropped on a table.

Peering through the woods, I tried to spot the singer. I spied a swatch of light in the distance, framed by dark evergreen boughs. As I headed toward the swatch, the song grew louder and louder, until I stepped from the shade of the forest into a sunlit meadow, an island of light in a sea of darkness. And there, on the tip of an old goldenrod stalk swaying in the breeze, clung that little minstrel of the meadow, the field sparrow.

I crossed the meadow and continued walking until I was out of earshot of the sparrow. Still no turkeys! I finally turned back.

As I retraced my steps, I heard the song again, wafting on the wind, and knew immediately where to find the meadow and the logging road. The sparrow's song, my last marker, was also the best one; the easiest to remember and easiest to find again.

THOMAS A. MEYER

Compass plant (Silphium laciniatum) can point the way.

As I walked back I started thinking about other birds that we only hear in one type of habitat. The rat-tat-tattle of a kingfisher, perhaps, or the jumbled and slurred notes of the Louisiana waterthrush usually indicate you are near water, and in Wisconsin, streams can be a really good landmark to follow if you get lost in the woods.

I remember a book called *Woodswoman* that my sister had given me when I entered college. One summer the author, Anne LaBastille, managed to lose her way in the Adirondacks. When she stumbled across a stream, she realized that, for all practical purposes, she was no longer lost. Walking downstream would bring her to a town and civilization sooner or later.

It didn't take me all that long to retrace my steps. A s I passed each landmark and got closer to the car, I relaxed even more.

Later that summer, while I was working in my native wildflower garden back home, I thought about plants that might serve as navigational aids. Many members of the sunflower group turn their faces toward the sun and follow its path. They face east early in the morning, turn to the south during the day, and face west by late afternoon. But navigation on a sunny day isn't usually much of a problem.

What about on a cloudy day? The compass plant's leaves could serve as a signpost. Its leaf blades face east or west, so that the edges of the leaves point north and south. This adaptation minimizes the moisture this prairie wildflower loses during the heat of the day.

My training as a naturalist keeps me interested as a hunter too. Even if I have a bad day hunting, I can always enjoy myself "botanizing" on the way home. And sometimes, as on that turkey hunt, I think my knowledge of many species gives me an edge over the hunter who mainly knows game species. You can gain confidence and peace of mind by taking visual and aural clues from plants, animals and other natural landmarks. Of course, you'd feel even better if you kept a compass close at hand. □

Mary K. Judd is a DNR state wildlife education specialist stationed in Madison.

SCOTT NIELSEN

Readers Write

THE SOUNDS OF SUMMER

I really enjoyed Pam Troxell's article "Inheriting the fireflies." There are so many summer evening sights and sounds to enjoy. You can listen to breezes blowing through the leaves. You can travel to lakes, rivers and beaches to listen to waves embracing the shores. You can listen to birds singing to each other in the soft, warm air. I just enjoy getting involved in the summer season.

Emmett O'Brien
Eau Claire, Wis.

OTHER LICHEN WORK

As a practicing lower plant biologist, I was particularly delighted to see the June issue highlight lichens as biomonitors.

An ongoing four-year program by the Milwaukee Public Museum in conjunction with the National Biological Survey and the UW-Madison National Parks Office is also assessing air pollutant uptake through lichens along 350 miles of the Lake Michigan shoreline. As a lichen expert and designer of the synthetic lichen "tree," I thought your readers would be interested to learn about biomonitoring research at other cooperative institutions.

Martyn J. Dibben
Botany Section
Milwaukee Public Museum
Milwaukee, Wis.

FAN OF THE FEEDERS

I want to let you know how much I enjoyed the June photographs and stories of animals that came to readers' feeders. The snapshots were excellent. They only make my wish for a cottage up north that much more meaningful. I just don't sense I'd see most of those pictures in the city.

Tedd Nardelli
Milwaukee, Wis.

Tedd, you'd be surprised. Raccoons, birds, flying squirrels, deer and a host of other wildlife roam our parks and the urban fringe. As we pointed out in our special 1987 issue about watchable wildlife, a lot of nature's lessons can be learned in back yards, city parks, streams and woodlots within blocks of many homes.

LINCOLN CREEK MEMORIES

One of my best childhood memories was brought back by your article concerning the present status of Lincoln Creek. How beautiful it used to be before it was lined with a cement runway. The greenery wore its natural beauty in the dressings of four seasons.

From 1946 to 1955, I played along this creek from Hampton Avenue to the north, south to Parklawn, east to the railroad yards off Hopkins Street, then north to Teutonia Avenue. I walked, biked, ice skated, looked for birds' nests, climbed trees and just joyfully hung out along that creek.

The populace then didn't toss in the types or amounts of junk you mentioned. Pollution was evident after storms near the sewer outfalls. By far, the greatest polluters were the businesses that built the twin square drain outlets just east of the junction of 35th and Hopkins Street.

This offending structure sat just north of a cement plant, a fuel oil company and, further south, the A.O. Smith Corp. It had an ineffective wooden boom that floated above the miasma which the drains oozed. Heavy oil streaked with white and yellow dammed behind it. It seemed a half-hearted attempt to restrain effluent. The whole idea of the outlet was to discharge waste that was illegal or unsuitable for the Milwaukee sewer system.

I can't recall a single time during those years that I read or heard of an objection to this practice. Was it considered arrogant or out of place at that time to question commercial wisdom in such matters?

In my child's mind, I blamed and resented the businesses due south of those outlets for the pollution. I couldn't imagine that one day people would have the right to demand not only a stop but a clean-up of such offenses!

The creek upstream of this point had crawfish, muskrats, an occasional turtle and small, rough, fish. What fun it was to skate on the winter ice and see the back fur of a travelling muskrat beneath your feet.

Downstream, water life diminished. Green slimy moss coated the rocks that we jumped. If we lifted a stone from the bottom, it was as black as the muds. We noticed, but never thought of complaining. We accepted it.

Now, in spite of littering, the right to regulate commercial and industrial polluters is the greatest thing working in this waterway's favor.

Runette Burchardt
Franklin, Wis.

Unfortunately, we are finding that runoff from paved streets, parking lots, businesses and homes also contains large amounts of chemical and bacterial pollutants. It will take combined pollution controls on businesses and stormwater to restore urban rivers.

SEVERAL READ EACH ISSUE

I thoroughly enjoy your well-explained articles with diagrams that show both how environmental problems happen and what we can do to solve problems to have a healthier Earth. I pass my magazines on to two sons and several grandchildren. They all enjoy at least one article in every issue. Thanks.

William Maiers
Cedarburg, Wis.

Our reader surveys show that most subscribers like to share the word. We now estimate that for each subscriber, three to four people see each issue of the magazine.

Thanks to all for writing and sharing your thoughts with our readers.

THAT OTHER PLACE IN NEBRASKA

One home where the cattle roam was misidentified in our August article on rotational grazing. The grasslands in Nebraska where cattle are used to graze a national wildlife refuge is at Fort Niobrara, not Niagara. The refuge is near Valentine, Neb. less than 10 miles south of the South Dakota border.

Continued from page 2

Young cones appear in May. The seeds are pollinated by the wind and ripen about five months later.

Seedlings seem to establish better in open areas. I've searched under stands of tamaracks off our road and haven't found any young trees in the woods. However, out along the edge of the ditches I've found several small tamaracks growing where they receive more sunlight. I've also seen healthy young tamaracks anchor their roots in the floating mats of sphagnum moss in the bogs of northern Wisconsin and Upper Michigan.

Wisconsin is near the southern limit of the tamarack's range. Tamaracks are an extremely hardy species that can withstand very cold climates. It can be found as far north as Alaska and east to Labrador in Canada. These trees grow best when they can keep their roots wet in bogs, swamps, and other lowland habitats.

The long, sinewy roots of the tamarack were used by Chippewa Indians to sew together pieces of birch bark into canoes. Longfellow referred to the tree in his famous poem "The Song of Hiawatha"...

Give me of your roots, 0 Tamarack!
Of your fibrous roots, 0 Larch Tree!
My canoe to bind you together,
So to bind the ends together,
That the water may not enter.

Today these trees are recognized for their straight trunks and resistance to rot. Tamarack wood is considered hard, heavy, strong and durable. As timber, it's used for railroad ties, poles, posts, pilings, and as rough lumber in the building trade. It is also used as pulpwood by the paper industry.

So take a fall stroll along a wetland path to search for flecks of gold needles left behind by the paradoxical tamaracks. Once the snow starts to fall in November, they'll go back into hiding until next October when they'll again provide autumn's last splash of golden color. □

Timothy Sweet writes and teaches in Clintonville, Wis.

SCOTT NIELSEN *(INSET)* ROBERT QUEEN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