



women in
**NATURAL
RESOURCES**

Volume 16, Number 2 September 1994

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Sustainable Development Planning
in Minnesota

Eastside Ecosystem Management Project
Surveying Ruffed Grouse
West African Drylands

*for professionals in
forestry, wildlife, range,
fisheries, recreation,
and related social sciences*

An attitude problem about population

In foreign affairs, the U.S. has a definite attitude problem. Is prejudice, neo-colonialism, post-cold-war military muscle flexing, or our per capita wealth at work on our diplomats' rhetoric here? Sure, a little. But I think it is much simpler than that. I think we participate with a superior attitude on the world stage because we have already argued most foreign policy issues to death first as domestic policy in our towns and media. Been there, studied it, already done it—e.g., attacks on hardened immigration positions have been floated in Miami with predictable results, tempering of inflammatory racial rhetoric is already underway in Los Angeles, in Texas bilingual schools shouted down again in the context of increased taxation. We participate in all this and more, before politicians speak for us on the global stage.

In the case of Haiti, good old saber-rattling averted the full scale mid-September invasion. But not before the President and the public had been advised *ad nauseum*. Cuba was not going to be invaded, but it was clear that neither was Florida by Cubans because we'd already had those discussions—lasting some 10 years—since the last incident. There was nothing new in anyone's position.

The affect of our public debates was most apparent in the case of the population conference in Cairo. There were few positions presented there that had not already bloodied heads here. Nor were we surprised to learn that the very hardened positions on reproductive rights in particular, and women's rights in general, came from countries (is the Vatican a country?) where public debate and dissent are not common nor encouraged by religious custom and dogma. These representatives who had not needed to argue it out at home wanted to greedily claim for themselves the limited time to explain what they perceived to be the

moral high ground—as if others had not already studied it and understood it.

The press dutifully recorded the hot debate and gave what was left of their coverage to vital women's issues of legal status, health, and education. Are these things intertwined with reproductive issues? Of course. Was a clear connection among them made by conference presenters? Seldom—but they should have tried harder. In some countries, women on average have more than six children: Ecuador, Nicaragua, Laos, Pakistan, Bangladesh, Ivory Coast, Nigeria, Libya, Saudi Arabia to name just a few. Far, far more children per woman than the average woman's years in school.

In Mexico, the fertility rate is 4.8 and 1,396 people share each nurse or mid-wife. In Syria, however, the average birthrate is at 7.2 children per woman with 2,500 people per nurse or mid-wife; in Bangladesh 21,000 per nurse or midwife; in Afghanistan the birthrate averages 6.9 babies per woman while 39,000 share one medical person. Is this a women's health concern, a legal rights concern, an education concern—or these countries' national disgrace?

For contrast consider that in Italy, the birthrate is 1.7 with 297 people sharing each nurse or mid-wife; in the U.S. the birthrate is 1.8 and the ratio to medical help is 148. In Canada, the ratios are better yet, while in Finland, the birthrate is 1.6 and there is one health care person for every 104 people. In Finland, the literacy rate is also 100 percent for males and females. In Syria, however, literacy for males and females is at 53 percent. In Nigeria it is an abysmal six percent for women and 25 percent for men; in Haiti women have an 18 percent literacy rate to 29 percent for men.

How are women going to make decisions about health care, legal rights, contraception, or anything else if they can't read about their options? The

answer of course is that they don't get to make decisions—they are told what the decisions are.

These are not boring statistics. Knowing them is vital to our understanding of why the population in the world is out of control and our natural resources endangered. Debating and studying these stark figures helps us understand that there will be no solution unless women everywhere are educated—to do their own studying of issues, educated to do their own debating, educated to help make the rules based on reason. And all of that will take years to bring about.

In the meantime, be tolerant of the U.S. and its foreign policy attitude. We helped shape it.

Dixie L. Ehrenreich

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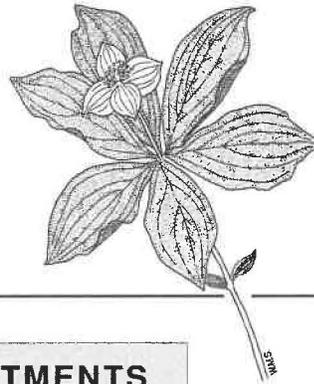
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(*Cornus Canadensis*)



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Black Chokeberry (*Aronia melanocarpa*)

On behalf of the committee for the Women in Forestry and Natural Resources Workshop, we want to thank you for your contribution of Women in Natural Resources Publications. We had a wide range of participants from Nepal attend this workshop, including female rangers, NGO project managers, members of the Institute of Forestry Faculty and representatives from the Ministry of Forests and Soil Conservation in Nepal. Everyone enjoyed looking through the journals and learning of the gender and natural resource issues in the states.

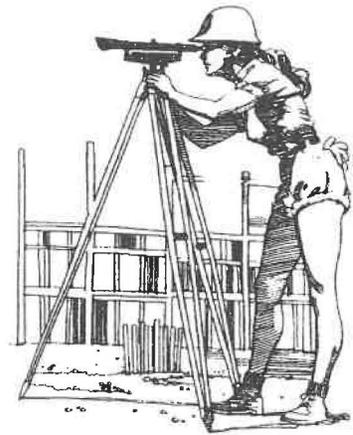
Erin Hughes, Institute of Forestry Project, Pokhara, Nepal

This cover sheet (see sketch at right) was used to advertise a device used to work with topo maps. Notice the length of the shorts that the model is wearing. I asked several persons who work in the field here in North Carolina and they say [surprise, surprise] they have never seen a woman working in this type of clothing.

Sharyn Alvarez, Raleigh, North Carolina

Women in Natural Resources is preparing an issue with a focus on women professionals who work in the Soil Conservation Service. For information about submitting a manuscript for that issue, call 208-885-6754 or fax a draft to 208-885-5878.

Finding the longitude and latitude of a point on a U.S.G.S. map doesn't have to be time-consuming and difficult . . .
Not if you use a TOPO-AID™



My girlfriend, who will graduate from the University of Arizona this October with a Masters in Renewable Natural Resource Studies is, as a student, short on cash and long on loans. The other day, she asked me if she should cancel her subscription to Women in Natural Resources. When I disagreed with the cancellation, I wasn't aware of the article "Fighting Sex Discrimination in Hiring by the Federal Government" by Joy Belsky, (June 1994). The practice of discrimination is widespread and runs deep into both sexes' minds. I have forever complained about discrimination in the aviation industry. Where female pilots out of college at 23 years old, with a minimum flight time of 1200 hours, can qualify for co-pilot positions with major air carriers before their male counterparts, having 5000 hours' flight time and 20 more years of experience. Partly because of this practice in the aviation industry, I quit flying and went to work for myself in an unrelated field. So that is my story.

My point is, is there enough concern to seek out attorneys with an interest in this industry? I would be willing to pay \$30 for the publication per year if \$15 went to a fund set up to assist those that have fallen into the pit of discrimination. So I recommend that because discrimination won't cure itself, and it takes a lot of power to even scratch the surface, you girls are going to have to get together and fight as a team. \$16,000 coming from a group is stronger than from an individual.

Bob Deming, Tucson, Arizona

Assistant/Associate Professor Forest Resource Economics, Oregon State University, Corvallis. Twelve-month, full-time, tenure-track appointment; approximately half-time teaching, half-time research. Salary and rank commensurate with experience/qualifications. Teaching includes: undergraduate, graduate and continuing education courses in forest resource economics, applied forest econometrics, and forest products markets. Opportunities also exist to participate in teaching within the University Graduate Faculty of Economics program. Research involves modeling of supply-demand, production-consumption, and market-price relationships related to policy changes in the forest products economy. Requirements: Ph.D. in forest resource economics or closely related field by the time of employment, anticipated to be April 1, 1995. Also teaching, research, and business or policy experience in the above areas. Ph.D.-level proficiency in econometrics is particularly important.

Send resume and request that three letters of recommendation be sent by January 1, 1995 to John D. Walstad, Forest Resources Dept., Oregon State University, Peavy Hall 108, Corvallis OR 97331-5703. *OSU is an AA/EEO employer and is responsive to dual career needs.*

Human Dimensions in Natural Resource Management, Department of Forestry, Virginia Tech, Blacksburg, Virginia. The Department of Forestry invites applications and nominations for a 9- or 12-month, tenure-track faculty position. Given the traditional land-grant institution responsibilities, the successful applicant will be expected to: conduct research in the human dimensions of natural resource management; advise undergraduate students; teach undergraduate and/or graduate courses in the human dimensions of natural resource management and in natural resource recreation; recruit and supervise graduate students; and participate in faculty governance. Qualifications: Ph.D., strong disciplinary skills in a noneconomics discipline relevant to the human dimensions of natural resource management (e.g., sociology, communications, planning, political science, psychology, leisure, geography, anthropology), and ability to work with colleagues from different academic disciplines and different natural resource professions. A degree in a natural resource field is not mandatory, but a demonstrated ability and willingness to work on natural resource issues is essential. Salary and rank commensurate with qualifications. *Applications accepted until December 1, 1994, or until a suitable candidate is found.*

Send letter stating reasons for interest, areas of expertise, vita, transcripts, and names and addresses of three references (or direct inquiries and nominations) to Dr. R. Bruce Hull, Search Committee Chair, Dept. Forestry, College of Forestry and Wildlife Resources, Virginia Tech, Blacksburg, Virginia 24061-0324 (703-231-7272; fax 703-231-3698). EMail:hullrb@vt.edu. *Virginia Tech seeks diversity, including women, minorities. People with disabilities desiring accommodation in the application process should notify the search committee chair before deadline (TDD 703-231-3749). An EO/AAI.*

8 April 1994

OPINION

Dear Sirs:

I was disappointed to read in the brochure for the symposium on Ecosystem Management in Western Interior Forests, which you are chairing in Spokane, Washington next month, that you have invited only three women out of a total of 54 speakers (5 percent) to participate in the plenary sessions and panels. This under-representation of women in the symposium perpetuates the myth that only men have the training, the ability, or the interest to participate in management of our forests.

It also demonstrates a past and continuing problem with admitting women into the field. Whether this omission was deliberate or inadvertent, it strongly suggests a lack of sensitivity toward women in resource management. In fact, women already play dominant roles in many areas of forest and natural resource management in the Pacific Northwest and have earned the right to be included in conferences such as the one you are running. Your near complete exclusion of women from this conference prevents the public from recognizing the important roles already played by many women and denies other women the opportunity to gain recognition and achieve prominence in their fields. And since it is being funded to some degree by public moneys, it may also be illegal.

Before the conference begins, I hope you will select speakers who better represent the diversity within the pool of qualified professionals. There are many outstanding women scientists, foresters, and land managers in the western United States. With just four phone calls I came up with the enclosed list of 88 women who could speak on social, scientific, and forestry issues associated with western interior forests. I am not personally acquainted with all of these women; neither am I acquainted with all of the men on your program. However, of those I do know, the women are equally or more highly qualified to speak than the men you have already invited. Many are quite prominent in their fields; others have not achieved the leadership positions they deserve due to their having been denied equal access to jobs and recognition - a point well illustrated by your program.

I'm sure I have left out many important women leaders; a few phone calls on your part would probably triple the number. I have no doubt that each of these women could suggest another three women who could also speak with distinction. Past discrimination against women in the fields of forestry and natural resource management is no excuse for you to perpetuate this practice. Your having included no professional women from the U.S. Forest Service, BLM, or the U.S. Fish and Wildlife Service, or from Washington State University, the University of Washington, or any other university illustrates the severity of federal-agency and academia's myopia when it comes to women professionals. This is a disgrace.

At a time when President Clinton has shown that it is possible to find many qualified women for important leadership positions, and when he is calling for forest reform, for inclusion of new voices in decision making, and for new and creative ideas in resource management, it is critical that the U.S. Forest Service and western universities recognize that all voices need to be heard and that no group be excluded, especially those who were excluded in the past. It is ironic that many of the men you have chosen to invite are the same ones who helped establish and maintain the current "train wreck" in the forests of the western United States. It is an issue that should be discussed at the conference.

Oregon Natural Resources Council will be asking the U.S. General Accounting Office and Representative Mike Synar to look into the chronic under-representation of women forestry and natural resource professionals at conferences and public workshops supported by federal funds.

Yours truly,

A. Joy Belsky, Ph.D., Staff Ecologist, Oregon Natural Resources Council

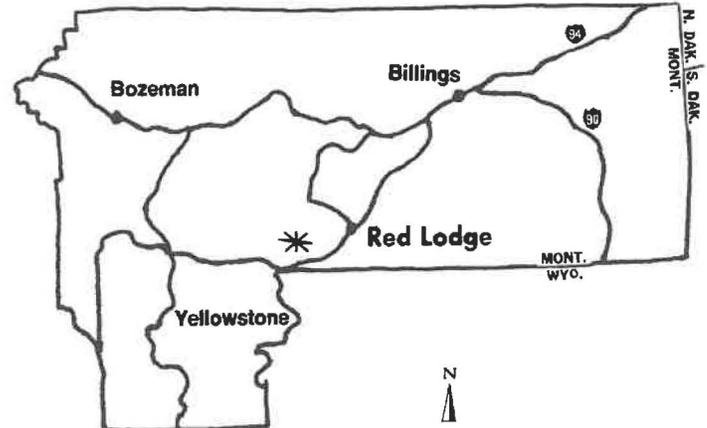
Editor's note: The preceding letter, and ones similar to it, have been sent recently by the author and others to organizers of conferences in their regions that have a noticeable dearth of women presenters advertised in their brochures. This particular letter included a list of 88 women and their affiliations, plus a long list of administrators and managers to whom it had been copied.

Our purpose in printing the letter is to provide a "template" of sorts for readers to use when they receive conference materials with few women presenters which they believe misrepresent the contributions that women are making and have made to that field. With that in mind, Women in Natural Resources has removed the names of the university professor and Forest Service employee to whom it was addressed; neither did we reprint the letter which the two sent back in reply, nor the author's second letter in reply to that one. And to save space we did not print the lists of names which were attached to the letter and which would have to be, in any case, generated anew to be region-, discipline-, and conference-specific.

AT TIMES LIKE THESE, I REMEMBER WHY I GOT INTO THIS WORK. THIS SURVEY WORK IS THRILLING—A REAL PRIVILEGE TO PARTICIPATE. AT THE SAME TIME IT INCREASES OUR KNOWLEDGE.

SURVEYING RUFFED GROUSE IN ASPEN STANDS

BARB SPRINGER BECK



Beep, beep, beep. Blackness. Oh geez, its 4 a.m. already. Gotta get right up or I'll be back asleep. I tumble out of bed and into the jeans and boots I laid out the night before—knowing how limited my capabilities would be at this hour.

Today, May 28, is week number four of my six weeks of volunteer work surveying ruffed grouse on the Custer National Forest which borders Yellowstone National Park on the Montana side. The survey program is a collaborative effort of the Forest Service, Montana Department of Fish, Wildlife and Parks, the Audubon Society, and the Ruffed Grouse Society. These surveys on the Beartooth Ranger District will establish baseline population information, and gauge the effectiveness of actions designed to improve habitat. I began observations one month ago after attending an orientation which covered project objectives and methodology. This is the fourth year of the study.



At 4:15 a.m., still groggy, I load my equipment and myself into the car, and head across the base of the spectacular Beartooth Range front. I will be able to enjoy the views on my trip home after the sun has risen. The drive to my study area is a mild rollercoaster ride as I drop into the Red Lodge, East Rosebud, Ingersoll, West Rosebud, Fiddler, and Fishtail Creek bottoms and over the spines between them.

At each creek crossing I hear the swollen waters, fed by snowmelt from the mountains rising to the south. My eyes strain and dart rapidly along the 40 miles of roadsides I'll travel this morning in search of other eyes, reflecting back at me. I am occasionally fooled by an errant highway reflector out of sequence. I spot and brake for many deer moving in the first light of day. I slow purposefully as I round the curve into the Top Hat Ranch to avoid the peacock which has made the road his habitat.

Then I head through the "town" of Dean, too small to make the map, its few buildings huddle along the highway for company. Up the dirt road. Thump, thump, thump. Crossing the cattle guard at the National Forest boundary, I'm

almost there. The sky has cooperatively lightened in the east so that I will be able to make my way through the aspen.

I park at the edge of my study area, get out and then stretch as the cold air greets me. I move quickly now to stay warm while I gather my equipment: hard hat, gloves, forms, pencil, clipboard, and binoculars. It's time to head into the stand. My watch says 5:15 a.m.

Aspen stands, which are critical habitat for ruffed grouse, have been disappearing from Montana's Beartooth front and many other areas due to fire suppression. Fire in a natural role acts to regenerate the aspen. One aspect of this program is to encourage aspen regeneration through the use of prescribed fire. Providing enough high quality habitat will allow ruffed grouse to flourish.

I am responsible for locating and listening at nine stations along a transect which weaves through an aspen stand that is prime grouse habitat. The nine stations cover the length of the aspen stand with sufficient distance between them to avoid double counting the same bird. Two additional

surveyors are at work in other stands across the District. I start into the trees along the line of yellow flagging hung from branches to find the first listening station. Each station is marked and numbered by red paint on a large tree. After a short walk I arrive at Station One where I check my watch. My observation period at each station is four minutes. I will record the number of "drums" heard, the number of birds drumming, and all wildlife observed. In southcentral Montana, the mating, or drumming season starts at the end of April and concludes in early June.

Within moments, I hear what I have come for. One pair of wings begins to beat. It starts as a low vibration, slow thumping in my eardrums, at first undiscernible from my pounding heart. But the drumming soon crescendos in intensity and speed as the male ruffed grouse completes his invitation to potential mates. The duration of each drumming sequence, the beats which continue the survival of the species, lasts a mere five seconds. When the study was designed, four minutes was believed to be the average interval between drumming sequences. At the end of four minutes I record three drumming events by one bird, and head through the trees along the flagline toward Station Two. I hear and note two birds drumming at Station Two and one at Stations Three and Four.

At Station Five I hear and feel a grouse drumming. He's close, very close, but well camouflaged. I wait quietly for his next sequence and spot the movement of wings when he begins again after a two minute rest. I move slowly toward his location and observe him on a downed log, called a "platform," adjacent to a wet pothole, with a large fir tree at his back for protection.

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The ruffed grouse stands 16-19 inches and is a mottled brownish color with buff streaks. His fan-shaped tail has cross barring on a gray base with a broad black band at the tip. Although he is aware of my presence, he is undeterred in his efforts to attract a mate, and continues with three more drumming sequences.

I watch as he raises up and spreads his wings to beat out his hopeful call. What I observe gives me a thrill and makes the 4 a.m. wake up all worthwhile.

Female grouse, while present, are not counted in this study. Their lack of audible activity makes it difficult to locate them and determine their sex; nor is there significant color distinctions between the sexes.

Progressing through Stations Six, Seven and Eight, I wend my way up through the boggy aspen and concentrate on walking quietly. Even so, telltale branches snap loudly underfoot. The vibrations of many more drummers fill the air along my course. I step carefully from rock to rock where I can, to avoid sinking instantly to mid-calf. Small wet potholes throughout the stand contribute to habitat quality but for me serve only as mosquito nurseries. I hurry past them, trying not to let the moisture invade through the tear in the leather of my left boot. A small stream gurgles by and then disappears, hiding just under the surface and surprising me with a suck and tug at my feet.

As I complete my work at Station Nine, the last station, sun rays break over the horizon to the east, warming and lighting my way. A slight breeze touches the aspen leaves ever so gently, and they tremble in response with the low angle of the sun highlighting their delicate movements.

The trees are alive with the warbling and trilling of the chickadees, robins, and morning doves. The hairy woodpecker is silent today, although I sense he is still here. Next week I will locate his tapping and watch him at his occupation, extracting bugs.

After the approximate six-week drumming season, I will submit my observations to the Ranger District. These will be aggregated with the work of the two other observers and plotted against previous years' data to determine breeding availability of male ruffed grouse. Forest Service and Ruffed Grouse Society biologists will evaluate the information to determine population trends over time. District study coordinator Pat Pierson plans to continue the monitoring for a minimum 10-year period in order to distinguish natural cyclical population changes from positive response to habitat treatments.

Enroute to the car, I break into a meadow awash in wildflowers. The faces of the splashy yellow balsam root seem to train their attention on me until I realize the sun is rising behind me in the east. Tall, deep-purple lupine with delicate flowers stretch skyward and exhibit the best posture in the wildflower carpet, beyond doubt. The spectacular colors include the bright orange of the Indian paintbrush, the light blue forget-me-nots, delicate purple sticky geranium, perfect miniature white phlox, and the slender stalks with Q-tip like bistort flowers floating on a sea of green.

I rest on a rock forgotten by an advancing glacier years ago, to drink in the view and fragrance of the early morning. My view puts the landscape in its larger context, and brings me back from the boggy stand to the surrounding countryside. I remove my hard hat and wet

boots, taking satisfaction from completing my work for the day. On my way out, I stop to pick a small bouquet of lupine and balsam root, gently wrapping a wet kleenex around the stems. I am selfishly aware that by removing them their existence will be shortened.

As I head back through Dean and take the Fiddler Creek cut off, I soon pass a rancher's "watch donkey." He is steadfastly keeping guard over his flock of sheep, and requires no paycheck. Up the road another three miles, I encounter a truck loaded with hay. The rancher's salivating band of sheep, in close pursuit, are unwittingly cooperating with his plans to move them to another pasture. While I wait momentarily for the sheep to flow around my car, I check my hair for hitchhiking wood ticks. When the sheep have passed I'm again on my way, and now in daylight can take in the verdant meadows with the granite and snowfield backdrop of the Beartooth Range. My day has just begun, but it has already been meaningful.

Barb Springer Beck is President of Beck Consulting which provides services to natural resource managing agencies in facilitation, conflict management, workforce diversity, and team building. She currently lives in Red Lodge, Montana. Beck was formerly employed by the US Forest Service as an archeologist, Forest Resources Staff Officer, and has held two District Ranger positions in Montana and Idaho.



WEST AFRICAN WOMEN MANAGE CATTLE AND SMALL RUMINANTS. DESPITE LAWS AND CUSTOMS WHICH WORK AGAINST THEM, THEY CONTRIBUTE SIGNIFICANT INCOME, NUTRITION, AND WEALTH TO THEIR COUNTRIES AND FAMILIES.

WOMEN & LIVESTOCK MANAGEMENT IN WEST AFRICAN DRYLANDS

ALPHA K. CISSE
BARBARA A. HOLT

As compared with women in some East African countries, where women traditionally were not allowed to keep any livestock other than poultry, West African women of the Sahel and upper grasslands do manage livestock. Generally, if they receive animals from their husband's family upon marriage for bridewealth, these animals are kept apart in their own fathers' herds. The women's relatives may use the

meat and milk, but the offspring of the livestock will belong to their children. Animals such as donkeys, goats, and cattle received from a woman's own parents' dowry, however, remain in the husbands' herds. Women may acquire additional animals through purchase or gifts.

Carrying water, feeding, caring for animals, and processing milk are among a female's chores in most African countries. Women also provide most of the labor for feed crop production. These chores can be exhausting, especially during the dry season. There are few schooling opportunities for women who would like to be trained in better agricultural management—nor are they routinely offered solutions to simplify or ease the burdens of their animal care tasks.

In many—but not all—African countries, women cannot own land. Without land to back them up as an asset, access to resources needed to improve livestock management—such as the purchase of more land, or credit to buy better stock and services—is denied. African governments have not made the few legislative revisions necessary to make possible women's land tenure and inheritance rights.

In West Africa, nevertheless, women frequently are the primary managers of livestock at the local level; they make decisions concerning animals and the disposition of their products. Women's roles in livestock development, however, vary from one country to another, and from one region to another within the same country.

Guinea

Rangelands in Guinea are mainly composed of savanna grasslands and shrubs, except in the southern rain forest and along rivers and tidal areas. The Djallonke sheep and the N'Dama cattle breeds are the most dominant breeds in Guinea. Middle and Upper Guinea's grasslands are dominated by the grass tribe, *Andropogoneae*.

In Guinea, Fulbe and Maninka people represent at least 60 percent of the population. Livestock raising is the traditional activity of the Fulbe of Fouta Djallon in Middle Guinea. The West African trypanotolerant cattle breed, N'Dama, originated in the mountain range of Fouta Djallon, as did the Djallonke sheep and goat breeds. Although many of the Fulbe have turned to trade, they still consider livestock,



especially cattle, as the safest investment in rural Fouta Djallon.

The polygamous Fulbe men own most of the cattle, but women also own some that they obtained through inheritance, dowry, and/or bridewealth. Very often the cattle obtained by Fulbe women through bridewealth will be kept in the herd of a male relative who is responsible for herding and vaccinating them. Relatives may use milk and meat, but the offspring of the livestock belong to the woman's children. In this way the Fulbe women try to avoid future conflicts in case of divorce or death of their husbands. Such conflicts can be very serious in polygamous families. Even when their cattle are kept in the male relatives' herds, herding and vaccinating expenses still fall to the husband.

Animals such as donkeys, goats, and cattle, obtained through dowry, may be kept in the husband's herds. In addition to dowry or bridewealth animals, women may purchase their own animals. After marriage, if the husband is pleased with his wife, he may give her a few of his animals which then remain in his herd.

Fulbe women are responsible for milking and milk processing of both men's and women's cows. They also are responsible for milk sales, feeding, manure collection, and health care. In Middle Guinea, the Fulbe make a mineral supplement for animals called "tupal" composed of salt, various medicinal plants (i.e., *Parinari benna*) and termite mounds. Rice straw and peanut leaves are used as hay. They feed rice and corn bran to milking cows.

Fulbe women own small ruminants other than cattle. The Djallonke goats are very resistant to most tropical diseases, but because of their lack of gregarious instinct, they are not herded in the Fouta Djallon. Moreover, goats and sheep are not dairy breeds, and women only milk them for specific purposes. Some women believe that goat milk can make children more intelligent.

Milk is processed by Fulbe women into sour milk, cream, and butter. These dairy products

are sold in their own compounds, from door-to-door around the village, or in the public market. In larger quantities women take milk products to the neighboring villages, along with chickens and eggs, to be sold in weekly markets.

Animals are not guarded during the day, but are brought back to the compound in the evening to facilitate health care and manure collection—which women use as fertilizer for their gardens. In the Fulbe community all compounds are surrounded by live fences of acacia or other plants to prevent animals from getting into the women's gardens.

Fulbe women love animals so much that many of them keep the very young animals in their houses when it is very cold; if a heifer dies they grieve for days. These women do not sell cattle; they prefer to save them for their sons.

Old cattle, however, are sold to butchers or to people who need live animals for social or spiritual ceremonies. As in other Islamic regions, small ruminants such as a ram should be sacrificed at the naming ceremony of a newborn before his name is told to the public. White and red roosters are also saved for sacrifices. Cattle and sheep are also extensively used in social and religious ceremonies such as sacrifices, baptisms, funerals, and marriages, and to celebrate the end of the harvest season. In Guinea poultry is the most expensive meat and, as in most West African countries, chickens are offered only to honored guests.

Land ownership is very complex. In theory the government owns all the lands. Traditionally, however, individuals may own land. In Guinea, theoretically also, women may own land given to them by their husbands—but if they divorce, they lose the land. Land owned by individuals may be used for gardens or for field crops; land not owned by individuals can be used for pasture.

In the dry season, Fulbe men herd their cattle to the coastal lands of Lower Guinea seeking grazing areas for the animals; this is called "transhumance."

They return to the mountains four to seven months later. Sometimes young wives follow their husbands during the transhumance but older women and young children stay home. For those left home, transhumance means extra work, especially for women who become responsible for their husbands' duties in addition to their own production and traditional chores in the household. In the Fouta Djallon during the dry season, the responsibilities of women are even more aggravated by the departure of young migrants, or "navetanes" seeking employment in Senegal.

In the rest of the country, male out-migration recently has been directed to Sierra Leone, Liberia, and the Ivory Coast where they seek employment as laborers on plantations. The traditional rural exodus toward urban areas also is complicated by another type of migration in Upper Guinea, e.g., the migration to the mines of gold and diamonds in Guinea and Sierra Leone. Overall, those migratory movements increase drastically the number of women heads of household in the country during the dry season.

In another area, Upper Guinea, there are similarities as many Maninka men and women also own cattle, sheep and goats. However, they have neither the skills nor the commitment of the Fulbe people as far as livestock production is concerned. They are more trade-oriented. Maninka women trade clothing materials and grains in the city, and in the villages they trade grains, condiments, cola nuts, tobacco powder, and cigarettes. Opening new roads to remote areas, however, usually results in lowering the income of women traders who then become dominated by big traders who move in.

Maninka women control most of the livestock production activities of the household, while their husbands control crop production. Men also build fences and do the herding. The Maninka women who do work in livestock prefer to leave their cattle in the hands of a hired Fulbe herder to whom they agree to give the milk production of every Friday, with

or without a monthly salary. (Milk is central in the diet of the Fulbe, so that agreement is essential.) Maninka women own a few cattle, also obtained through inheritance, dowry, and/or bridewealth. They also may own several sheep and goats. Maninka women consider livestock like savings accounts, and will be willing to sell a number of them to increase their capital for trade, to prepare for their children's weddings, or to overcome a very difficult situation. They control their income from crops and livestock sales, as well as from trade unless they are using their husbands' money.

Mali and Niger

Mali and Niger are both Sahelian countries: hot and dry. In the Northern regions located at the Sahara desert border, soils are sandy and trees rare. In those areas, rainfall can be under 200 mm. annually. Rangelands are covered with shrubs and grasses adapted to the local environment such as *Cenchrus biflorus* and *Eragrostis tremula*. These areas support the largest livestock population of the region and these activities are important in their economies. Haoussa women of Niger favor the Maradi Red breed of goat that is becoming popular in that area.

In Mali, the lion's share of livestock production belongs to the nomadic groups of Northern Mali, the Peulh, Touareg, and Maure people. Culturally, the Malian Peulh can be compared with the Fulbe of Guinea. Their women's involvement in livestock production is similar to the Fulbe women; they milk cows, process milk and market milk products. Malian women are predominantly active in small livestock husbandry—goats, chickens, and sometimes pigs and sheep. In Mali, the primary purpose of raising farm animals is not so much to improve nutrition as it is to increase their numbers and a family's wealth.

Burkina Faso

Burkina Faso, formerly Upper Volta, is also a Sahelian country. Its climate and rangeland conditions are similar to those of Mali and Niger but women's lev-

els of participation in livestock management vary from one ethnic group to another. Cultural and physical similarities among the Guinean Fulbe, the Malian Peulh, and the Fulani of Burkina Faso are noteworthy.

More than one-third of Fulani women are cattle owners, but permission of males responsible for herding their animals is required before any sales can be made. Women, however, are entirely responsible for milk sales with no male permission required. Using the proceeds from their milk sales, women buy clothes, jewelry, condiments, and millet.

As in most West African countries, cattle are obtained through inheritance from relatives. They are not to be sold after Fulani women are married but are kept for their sons, assuming that their daughters will be supported by their husbands. Fulani women are reserved when it comes to talking about their rights in cattle, especially in the presence of other Fulani women.

Another important trait of Fulani women is that they are not as interested in chickens as they are in cattle or small ruminants such as sheep and goats. Attempts to involve Fulani women in poultry projects have not been successful. In contrast with the Fulbe women of Guinea, neither are they interested in gardening.

The Riiimaabe represent another ethnic group of Burkina Faso. About half of them own goats, and a few of them own cattle. As in the Fulani community, women are responsible for milking and processing dairy products, but here milk and milk by-products are not for sale, but consumed in the compounds.

A third ethnic group in Burkina Faso are the Mossi, who usually are involved in crop farming. Although Mossi women may own cattle, fewer than half consider cattle as the best investment for women.

Governments should react to women's contribution to livestock production

Women's access to resources needed for livestock management, such as land, credit, and services must be increased. Laws concerning land tenure and inheritance rights in some African countries could be revised to provide women with collateral for investment loans. Greater services and education should

be provided for women as well as for men to enable women to more efficiently do the work they already do.

Cultural factors are evolving rapidly in this region of Africa. When considering livestock development projects—funded from within an African country or from an outside donor country—the local customs and roles of women as well as men should be considered. African women livestock producers already play a vital role, a fact which should be rewarded with more power and resources, not overlooked, in the struggle against hunger and poverty.

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Barbara A. Holt, Ph.D., is Associate Professor in the LSU School of Vocational Education in the College of Agriculture. She has taught courses related to women in development, and helped organize the LSU-Southern University Association for Women in International Development. She lived for five years in West Africa and countries in Central and South America where she taught and carried out consulting and research projects concerned with improving the lives of women.

EYEBALL ALERT

KAREN LYMAN

I've done a lot of embarrassing things in the name of Science recently, submitting to some pretty disgusting medical maneuvers. But then, who among us hasn't contributed to Knowledge in some deeply revealing and personal way? I've done the old This-isn't-going-to-hurt-if-you'd-just-relax-so-bend-over-and-stop-whining. I've been prodded, poked, punctured, and topped off with scary stuff that glows in the dark. Doctors and their minions have examined, imaged, and viewed my pathetic body inside and out from all kinds of unspeakable angles. I often think that medical technology is a little too pushy for its own good.

But this latest test I took has to beat them all. It's called a Sleep Study and it was ordered to root out sleeping disorders. Like what kind, nobody bothered to tell me, but I'll just bet there's no check-off box that reads: Sleeps in Same House with Pre-schoolers.

The test itself is pretty straight forward. You

sleep, they study. However, the patient's role isn't so easy; trying to snooze with over 20 electrodes and various paraphernalia strapped to the body. That, everyone assured me, I would get used to.

Oh really?

The answer is no, you don't get used to it. But you can get tired enough to sleep—even covered with more electronics than the inside of Radio Shack.

I drove myself over and checked into a local hospital late one evening and was directed to its neurology lab where I found the special Sleep Study Room, complete with big signs cautioning "Quiet!! Sleep Study in Progress!!" The room looked like the standard issue hospital cell except for the big window with the space-ship-like control room behind it. Not to mention the video camera discreetly installed in the ceiling above the bed.

Once I had climbed into jammies, the technician took the better part of an hour to glue on the electrodes and other gadgets (and yes, she

used real glue, even in my hair). Most of the wires are hooked up to your head, near eyes, nose and mouth, too. But a few went other places. The technician was relieved that I had shaved my legs so she didn't have to.

Then I got into bed. No reading, no television; it was strictly lights out. So I lay there for nearly two hours knowing that if I picked my nose, scratched my rear or emitted unseemly noises, I would be doing so for posterity. I could no more sleep than fly to the moon.

It was that camera that really got to me. I don't much care to be filmed. Period. Not by anybody. Not at Aunt Bertha's birthday party, all cleaned up and sober. And certainly not wired for take-off in a strange bed. Seemed kinky, like something Tonya and Jeff might do.

But eventually, I did sleep. When I awoke for my customary bathroom break, all I had to do was croak, "Joanne," and my personal sleep slave rushed to my side from Command Central to unharness me.

As she yanked wires and unplugged electronics

she informed me that I had had only one dream and not much deep sleep. "And you took one hour and 47 minutes to fall asleep," she said sternly, as if there were anything I could do about it.

It was rise and shine at 6 a.m. with a full report on what a lousy sleeper I was. No coffee, no croissants, no morning newspaper. Just, "You did a crummy job."

Not only that, but the technician had neglected to mention that the hospital tried to page the owner (me) of a car with its lights on all night. Nothing like a dead battery before you've even had a cup of coffee.

And you know what high-tech solvent they used to remove glue from my hair? Fingernail polish remover. It did some amazing things to my hair color.

All this fuss over sleeping poorly—as if any of that was news to me. Listen, I know exactly when I'll get a good night's sleep but unfortunately I'll be too deceased to appreciate it.

Karen Lyman is Associate Editor of Women in Natural Resources.

TECHNOLOGICAL ADVANCES BRING CHEAPER ELECTRICITY FROM WIND CLOSER TO WHAT THE DEVELOPERS HAD ALWAYS PROMISED.

WIND POWER

CARLOTTA COLLETTE

The wind at Altamont, just 30 miles east of San Francisco, is perfect for making electricity. Other places may have steadier gales or great bursts of it, but the Altamont Pass has wind, a need for power, transmission lines to move it, and, perhaps most important, timing.

East of the San Francisco Bay Area, dry grass hills slope upward before dropping down to the Central Valley. From April through October, the

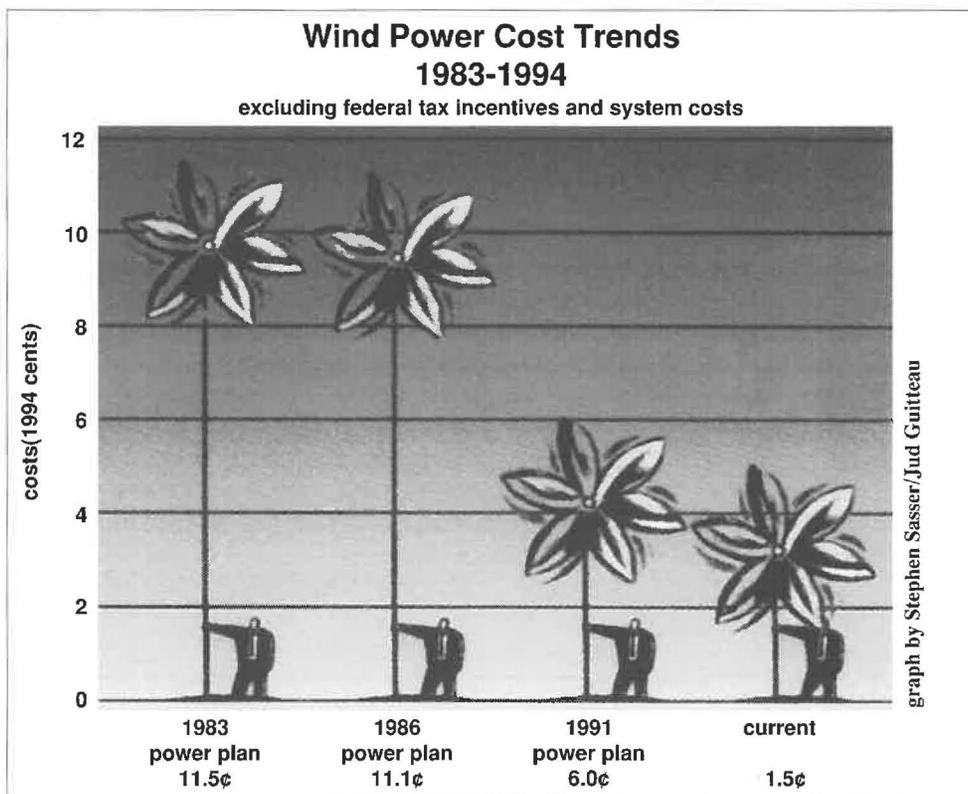
wind coming off the ocean warms as it crosses the land and picks up speed as the hot inner valley tugs at it. On summer afternoons, the winds pick up at just about the time people start turning on their air conditioners. Perfect! The increasing wind speed synchronizes with northern California's greatest need for electricity, and several California electric utilities were smart enough to capitalize on that.

The Altamont lessons

Wind energy developers capitalized on the Altamont, too. It was easy. With federal and state tax credits that were based on putting towers up, whether or not they successfully generated electricity, the Altamont became the new mother lode. In less than a decade and a half, more than 7,000 turbines were installed there, in long rows covering more than 80 square miles.

Altamont is the world's biggest "wind farm." Altamont and two other smaller California wind farms together generate more than enough electricity for the city of San Francisco, about one percent of all the electricity used in California. But a number of the turbines never spin. They are rusting in place, victims of the tax structure that created them and the immaturity of the industry when they were installed. Altamont is the place where all the mistakes were made, the place everyone who hates wind power complains about. It is also the place where early lessons were learned, and experience gained there is now being put to use elsewhere across the United States.

Altamont taught wind power developers a lot about



what does and doesn't work. They now can offer advanced technologies, more conscientious siting, better reliability, and much lower pricing than in the past. "The cost of electricity from wind has come down about 20 percent just since 1991," says Jeff King, senior resource analyst with the Northwest Power Planning Council in Portland, Oregon. "When you add in the new federal credits for private utilities buying wind power—1.5 cents per kilowatt-hour—you get a competitively priced new resource." The Council called for demonstrations of regionally applicable wind technologies in its 1991 Northwest Power Plan, largely because the region has so much potential for wind development. The power plan estimated that Montana alone could provide more than 4,000 megawatts of wind power—enough for four metropolitan areas the size of Seattle. And, as at Altamont, when the need for electricity is greatest—in much of the Northwest, it's in the winter—the winds blow strongest and steady.

But economic, technological, environmental and public opinion obstacles have to be overcome before the vast resource can be tapped. Wind development companies are responding to the challenge.

Technological advances

Arguably the most important breakthroughs are technological, and these have almost all occurred at West Coast wind companies. Three wind developers: Kenetech Windpower (formerly U.S. Windpower), based in San Francisco; Advanced Wind Turbines, Inc., of Redmond, Washington; and Zond Systems, Inc., of Tehachapi, California, have made significant improvements in blade designs and electronic controls.

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Kenetech Windpower is the 20-year-old "granddaddy" of the American wind industry. Begun in 1974 by two engineering professors from Harvard and the Massachusetts Institute of Technology (but not incorporated until 1979 as U.S. Windpower), Windpower was one of the first companies to take advantage of federal and state support for the development of renewable energy resources.

The professors' small company is now the world's largest wind development corporation, with more than 1,200 megawatts of energy production to its credit and more than \$1 billion in project financing under way. About half the wind power generated at Altamont comes from Windpower's turbines (more than 3,500 turbines generating 420 megawatts).

The vast majority of Windpower turbines at Altamont and elsewhere are the company's "workhorse" model 56-100 with a 56-foot diameter rotor generating 100 kilowatts of energy. "The 56-100 is the DC-3 of the wind industry," says Clarence "Bud" Grebey, manager of corporate communications at Kenetech. "It is tough and reliable, kind of a classic." But Windpower wanted a turbine that could generate electricity for a nickel per kilowatt-hour. The 56-100 couldn't.

"With the new 33M-VS, we've produced the jet of the wind industry," Grebey boasts. Few in the business will argue the point. The 33M-VS' rotor measures 33 meters, or more than 100 feet, but it's the "VS" part that's the breakthrough.

Most wind turbines spin at a fixed rate so they can generate electricity at an even 60 cycles per second—the utility standard. The machines have to adjust mechanically to slower and faster winds, which can stress and ultimately, wear

out the equipment. To compensate, most fixed-speed turbines have been built like tall tanks, strong and heavily armored.

Windpower, working with California's Pacific Gas and Electric Company, Niagara Mohawk Power Corporation in New York, and the Electric Power Research Institute, built a variable-speed turbine with electronic controls that convert the different frequencies of generated electricity into a constant frequency, enabling the blades to take advantage of both fast and slow wind speeds. "We are able to produce four times the energy (400 kilowatts per turbine) at only two and a half times the cost," says Grebey. "We can now generate wind power for between three cents and five cents a kilowatt-hour, depending on wind speeds and constancy." This year Windpower celebrated production of its 100th turbine and promises to have 650 build before 1995.

The connection with European technologies

Advanced Wind Turbines and Zond Systems Inc., took different technological paths to obtain the same nickel a kilowatt-hour goal. Each of them looked more to simplifying their systems, rather than making them more complex. Robert Lynette, president of Advanced Wind Turbines, Inc., has been involved in wind energy as long as U.S. Windpower has been in existence. "In the early 80s most wind energy sites had imported turbines from Denmark. We built the European wind industry. All European machines were heavy, three-bladed, 8 cent a kilowatt-hour machines. We figured we could leapfrog the Danes and build a good 5-cent machine in this country" said Lynette.

Congress and the U.S. Department of Energy agreed, providing research funding to build low-cost, efficient and reliable wind turbines. The outcome at Advanced Wind Turbines, Inc., was a turbine with a 50-percent increase in energy generated (between 225 and 275 kilowatts per turbine) at "almost no increase in production cost," according to Lynette. "Our approach was to keep it simple," Lynette explains. "There are two blades instead of the typical three. There is passive braking. There's no variable speed. This is as low in complexity and as elegant as I know how to do and still keep it fail-safe. It's like a palm tree, it bends in the wind." Part of the blades' resiliency and lightness stems from the fact they are made mostly of wood—by a boat manufacturer. There are only two AWT-26 (26-meter rotor) prototypes running, however. "We've just begun to market these," says Lynette. "They have undergone so much testing. They have science behind them—\$5 million in testing. We're smaller than Windpower. But my philosophy has been, 'go slow, the market will still be there.'"

George Stricker of Zond Systems, Inc., has a very similar philosophy. His company has "enough cash flow and a good reputation in financial circles" to not feel any urgency about the near term. "We're securing a number of good sites and are investing carefully so we'll be ready to build during the next five or 10 years, but we're in no big rush. We have a lot of fun doing what we do."

Zond was another early leader in the wind industry. The company has more than 2,500 turbines, totaling 260 megawatts, operating around the world. But Zond's turbines were imported from Denmark.

WOMEN IN NATURAL RESOURCES 11

Birds of prey are dying at wind farms



About 150 million birds of all species die each year when they crash into windows, cars, tall buildings, and smokestacks. Others, particularly birds of prey like eagles and falcons, are electrocuted when they attempt to land on or fly through power lines. At the Altamont Pass wind farm east of San Francisco, researchers from the California Energy Commission and consultants have estimated that about 500 birds of prey died of various causes within the 80-square-mile site over a two-year study period. Approximately 78 of these were endangered golden eagles. These numbers greatly concern wind power developers—many of whom came to the wind industry because they think of wind as relatively environmentally benign. Communities where wind farms may be sited are also concerned.

Arguments can be made in defense:

- no one is certain how the birds are killed
- only Altamont of all wind sites seems so deeply plagued
- the numbers are relatively small and actual populations of these birds have increased rather than decreased
- development around the Altamont has turned the wind site into the only wild place left for birds and other animals.

But wind developers want to solve the problem, not just respond to criticism. The deaths of endangered species could kill the wind industry as well as the birds.

Kenetech Windpower has been leading the way in trying to prevent deaths since it was acknowledged in the mid-1980s. The company has purchased wildlife habitat to compensate in some part and spent more than a million dollars in research on turbine blades, bird behaviors, warning systems, and other projects. "Our objective is not to drive birds out of wind plants. This is good habitat. We want to make it safe for them," said Richard C. Curry, coordinator of the Avian Research Task Force that Windpower established to bring some of the nation's leading ornithologists together to help resolve the issues. As a result, the company has a three-part plan of action:

1. Develop and implement siting procedures designed to eliminate potential environmental conflicts. This includes identifying and consulting with local and regional experts, and reviewing any data about existing wildlife at all potential wind sites.
2. Mitigate any losses of plant or animal species affected by wind energy development, including replacement habitat.
3. Research and implement modifications of wind turbines or wind plants to prevent harm to wildlife.

The American Wind Energy Association and its member companies are working with the US Fish and Wildlife Service to develop guidelines for siting wind projects where there will be no likely impacts on wildlife populations.

"We were making components for the past eight or nine years, but we only recently started designing and building our own turbines. We installed and maintained them in the past. Now we can offer full service." The company's new turbine, the Z-40 is a 40-meter rotor on a massive structure that can generate up to 500 kilowatts per turbine. That the biggest in the U.S. "Ours is an incremental improvement," explains Stricker. "It's not a new departure into unknown technology. It will deliver cheaper energy over the 30-year life of the turbine than would turbines that are not as well built or as strong. The warranties on our turbines really mean something. There were a lot of companies during the 'boom and bust' period of the 80s that disappeared before their turbines failed. At Zond, there'll be a company behind the turbine. We've simplified many things. We have a stronger, more slender tower on a solid new foundation. We've used very advanced electronics that

make the operation smoother, resulting in less wear and tear. Our airfoil, which we developed with help from the National Renewable Energy Laboratory, combines elements of three kinds of airfoils."

New sites, new projects, new collaboration

At least three major wind projects, totaling 125 megawatts have been approved by Northwest utilities alone.

1. *Columbia Hills Windplant*. When Puget Sound Power & Light in 1992 solicited bids to supply electricity to its very rapidly growing service territory (Seattle area), few observers thought a wind power project would make it onto the short list. But with the new economics of the 33M-VS, the 50-megawatt "windplant" (a term Kenetech trademarked) made it through the first round of selection. With cosponsorship from Portland General Electric and Portland-based PacifiCorp, the project was approved and contracts signed this winter.

The 140-turbine wind farm is to be located three miles south of Goldendale, high above the Columbia River. The Columbia Gorge's formidable and steady winds will be generating electricity at this site as early as 1996, pending completion of an environmental impact statement.

2. *Wyoming Windplant*. Proposed for Carbon County is another 50-megawatt Kenetech/PacifiCorp joint project. Half the output of the plant will be sold to the Bonneville Power Administration. The project is expected to be expanded to 70.5 megawatts with participation from the Tri-State Generation & Transmission Association of Denver, the Public Service Company of Colorado and the Eugene (Oregon) Water & Electric Board. The Wyoming project will take about 200 33M-VS turbines. Kenetech has begun the permitting process to expand the project to 500 megawatts. The current-megawatt parcel should be completed in 1996.

3. *Columbia Wind Farm # 1*. Not far from Kenetech's Columbia Hills site is another site where a consortium of Washington utilities—the Conservation and Renewable Energy System (CARES)—has linked up with Robert Lynette's Advanced Wind Turbines, Inc. and FloWind Industries to develop a 25-megawatt project. The project will feature 91 AWT-26 wind turbines. Power from the project, which is scheduled for completion in 1996, is expected to be sold to the Bonneville Power Administration.

The wind movement grows

The American Wind Energy Association estimates that there are more than 2,000 megawatts of wind projects under negotiation or development in the United States. They report that 500 megawatts of new wind will be online by 1996 with big projects underway in Minnesota, California, and Texas as well as those in the Northwest. All of these will contribute to the wind energy industry's goal of installing 10,000 megawatts of wind turbines in the U.S. by the year 2,000. Already, the industry generates enough electricity to serve one million Americans—most of those currently in California, but the Northwest is coming up fast.

Carlotta Collette is the Executive Editor of Northwest Energy News. This article and photo are reprinted from the Summer 1994 edition of that magazine.

WHO DO YOU CALL ON TO CHART THE FUTURE FOR AN ENTIRE STATE? WILL FORMER ADVERSARIES WORK HARMONIOUSLY TOGETHER? WHAT WILL BE THE OUTCOME? WHO SHOULD CARE ABOUT WHAT THEY DO?

SUSTAINABLE DEVELOPMENT EFFORTS IN MINNESOTA

KATHERINE BARTON

There is a refreshing citizen movement taking place in Minnesota. It is refreshing because—when considering future development in a large state—it offers hope and optimism to those who examine it rather than giving rise to the usual blame and cynicism. The philosophy of sustainable development did not originate in Minnesota, of course, but sprouted from a statement in the report from the World Commission on Environment and Development (1987), known as the Brundtland Report—named after Chairperson Gro Harlem Brundtland, Norway's Prime Minister at the time. It defines sustainable development as progress or development "that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In Minnesota, the concept was considered important enough to launch a full fledged program, the Minnesota Sustainable Development Initiative. The Initiative idea came from the Minnesota

Environmental Quality Board (EQB), a key body composed of the chiefs of Minnesota's environmental agencies. Member agencies include the state Departments of Health, Agriculture, Natural Resources, Public Service, Transportation, the Minnesota Planning Office, the Board of Water and Soil Resources, the Office of Environmental Assistance, the Pollution Control Agency, as well as several citizen members. The EQB encourages a comprehensive approach to environmental issues and is chaired by Governor's Representative, Bob Dunn.

The EQB's current strategic planning sub-committee convened in 1991. Chaired by Commissioner Rod Sando of the Minnesota Department of Natural Resources (DNR), the sub-committee decided to undertake the Initiative as a way to look long term at resource issues and get beyond a short-term political agenda. The sustainable development approach also complemented an ecosystem management

method Sando's DNR agency has been formally pursuing since 1990. Ecosystem management thinking emphasizes the need for managing the entire natural system as a whole unit, rather than through isolated plant or animal species. Thus, bringing together people representing both natural and economic systems was a creative way to do long term thinking about sustainability. This ambitious, year-long dialogue brought together Minnesota's key players to talk strategically for a full year culminating with a Congress in February 1994.

The Process

In January 1993, with Governor Arne Carlson's blessing, the EQB's strategic planning committee launched seven teams: Forestry, Minerals, Recreation, Manufacturing, Settlement, Agriculture and Energy. The team charge was simple but demanding: *Create a strategic plan for each area respecting both the environment and the need for economic growth.* The teams,

each consisting of 14 citizen members representing diverse interests, faced the challenge of stating, with one voice, the direction the state needs to take in their area.

Each team had a neutral facilitator that insured members' equal participation and yet permitted focussed, worthwhile discussions. A collaboration of individuals from state agencies designed a process that could be adapted by individual teams. The group consisted of Katherine Barton and Terri Yearwood, Planner Principals from the Department of Natural Resources; Charlie Peterson, Georgie Peterson, Mirja Hanson and Jim Addington, Senior Consultants from the Department of Administration; and John Wells and Rolf Nordstrom from the Environmental Quality Board. Throughout the project, these individuals met monthly to guide the process, answer questions, and assure development of a quality product. Likewise, agency staff met with co-chairs and the facilitators

tor to plan individual team meetings.

In addition, each team had a "lead staff" liaison from a related agency. They were:

1. Agriculture: Paul Burns (Agriculture).
2. Energy: Mike McCarthy (Public Service).
3. Forestry: Mike Kilgore (EQB).
4. Manufacturing: Abby McKenzie and Scott Peterson (Trade and Economic Development).
5. Minerals: Dave Olson and Maryanna Harstad (DNR).
6. Recreation: Tim Kelly (DNR).
7. Settlement: Marilyn Lundberg (EQB).

The Teams

The heart of the Initiative was the teams. To actively encourage dialogue, each team was thoughtfully comprised of leaders in the areas of both economic development and environmental protection. Members represented a wide range of interests, such as farmers, resort owners, corporate executives, professors, voluntary and professional environmentalists, local government officials and many others. Following is a partial list of team members indicating this broad spread of affiliation.

Agriculture: Dave Nomsen of Pheasants Forever, Dwayne DeZiel, Minnesota Association of Soil and Water Conservation Districts (co-chair).

Energy: Elliot Bailey of World Power Technologies, Linda Thrane of Cargill.

Forestry: Howard Hedstrom of Hedstrom Lumber, Norma Martin of the Minnesota Deer Hunters Association, Dick Skok of the College of Natural Resources, University of Minnesota (co-chair).

Manufacturing: Dr. Robert Bringer, Staff Vice-President of 3M (co-chair), Anita Duckor of Northern States Power, Diane Jensen of the Clean Water Alliance, Kris Sigford of the Minnesota Center for Environmental Advocacy.

Minerals: Nelson French of The Nature Conservancy (co-chair), Lewis Wade of the U. S. Bureau of Mines.

Recreation: Dutch Cragun of Cragun's Resort, Cindy Hayden of the *Lake Superior Magazine* (co-chair), Jennifer Hunt of Voyageurs Region National Park Association.

Settlement: Beth Waterhouse of The Minnesota Project, Molly Woehrlin, former County Commissioner (co-chair).

Every team's strategic plan included the same elements. Team reports ranging

from 23 to 70 pages, with varying amounts of background information, were distributed at the Congress in February 1994. All reports contained guiding principles for sustainability, a 50-year vision statement, current issues blocking progress, and broad strategies to begin making headway over the next 10 years.

Following is an excerpt from the Forestry Team's report:

Vision: In future generations, Minnesota's forest lands will encompass 18 plus million acres. Forest ecosystems will be more healthy and productive than they are today. They will also be more diverse in the type and size of the tree species present to maintain the natural plant and animal communities associated with the state's ecoregions.

Principles: Forest resources shall be managed for the benefit of present and future generations. Multiple ownership cooperation in addressing forest resource management should be encouraged.

Issues: Efficient/fair decision making systems are needed. Increasing demands on the state's forest resources will result in increasing conflicts over their use and management. Stakeholders of Minnesota's forests need to be identified and brought together, and means identified that will efficiently and fairly resolve those value conflicts.

Strategy: Develop a forest resources assessment and evaluation program sensitive to Minnesota's needs (partial list below). (a) Develop an ecologically-based classification system useful to landscape level planning efforts that can be applied and used across ownerships. (b) Establish continuous monitoring and evaluation methods for determining existing forest protection processes and conditions, and means of incorporating the results into forest management decision making.

The report format allowed each team to take into consideration its individual needs for information and dialogue. The Minerals Team, for example, took overnight field trips throughout the state, educating its members on the realities of mining in the nineties. The Manufacturing Team had breakfast meetings in St. Paul, concluding after one presentation, that they preferred reviewing written information to personalized discussions. The Settlement Team met all day during each of its monthly meetings, dividing the session between educational presentations

with outside speakers and creating work products in the afternoon. The uniqueness of each team served as a strong reminder of the need to honor diversity in both the process and solutions. In addition, the Initiative held four integrated sessions during the year in which all seven teams met together and talked about common themes.

Often fraught with lively discussion, the process finished with, amazingly, no minority reports. The facilitators insisted on mutual respect for all points of view, and were largely successful in creating an atmosphere of listening and inquiry. The teams developed enormous loyalty to their products. One team member said she would most remember "the willingness of individual participants from diverse backgrounds and with differing views to move toward a common vision rather than focusing on areas of disagreement."

Integrating Team Concerns and Strategies

The Initiative champion and mentor, Commissioner Rod Sando, was particularly concerned about getting teams to understand that their concerns were not unique to them but shared by some, if not all, of the other areas. After the first integration meeting four months into the project, several themes emerged in the teams' strategies which consistently repeated. A sample:

Education: The need for more information about how what we do affects our future community, environment and economy. Teams recommended: (1) Continue the forum begun in the Initiative teams. (2) Encourage others, beyond the government, to begin similar Initiatives.

Incentives and Disincentives: Currently, Minnesota has few policies that encourage sustainable development and many policies that discourage sustainability. Teams recommended: (1) Assess Minnesota incentives and disincentives to find opportunities for correcting actions that encourage unsustainable public policies, business practices and individual behavior. (2) Redirect state investments into cooperative ventures that promote and develop sustainable products and practices.

Accounting of Costs and Benefits: Incomplete accounting of environmental costs and benefits leads to uninformed and thus inefficient decisions by the public and private sectors, including consumers.

Teams recommended: (1) Pursue opportunities for full-cost accounting that fully account for the environmental and social costs of decisions. (2) Promote using and sharing full-cost information

Knowledge and Information Management: Current data are inadequate to know whether Minnesota is on a sustainable course or not. (Teams quickly found that useful data was woefully lacking in their topic areas.) Teams recommended: (1) Inventory the resource base, building on such efforts as the county biological survey, county soil survey, and national wetlands inventory. (2) Chart environmental quality trends through establishing a system of environmental indicators based on monitoring specific biological resources and ecological systems.

Land and Natural Resources Use: There is no coordinated use of these resources at the state level. Teams recommended: (1) Foster sustainable communities by creating a new framework that ties together all the factors influencing land use and community development, from reducing sprawl and adverse environmental effects, to providing affordable housing, efficient transportation and ample employment opportunities. (2) Integrate resource management by creating a watershed-and ecosystem-based framework which pulls together all resource management programs.

Role of Government and the Private Sector: The teams suggested many ways both government and private sector can encourage sustainable development. Teams recommended: (1) Apply Initiative strategies to Minnesota to become a state model of sustainable development. (2) Create strategic alliances among government, business, environmental, and community interests to carry out Initiative strategies.

Initiative Products, Hard and Soft

The final Congress drew together other interested parties to revise team plans, expand awareness and identify critical next steps for Minnesota. The input from the Congress is in the process of being synthesized. The Initiative's final report, including both

the teams' work and input from Congress participants, was due out in August 1994.

Equally important, EQB staff are examining the project's data to choose appropriate actions from the more than 100 strategies suggested. These strategies will inform legislative activity, provide direction for agency policies and inform further agenda items for the EQB.

As important as the strategic plans was the rich dialogue and participant education that blossomed during the project. People who normally never would sit around the same table worked together for a full year. At one meeting, a prominent developer spoke of his frustration with local zoning ordinances. A local government official responded with her interest in creating ordinances that gave more leeway, but had been strongly advised by legal counsel of the necessity of writing ones that left little room for interpretation. In another forum, business owners talked about the difficulty of recovering urban land. Anyone who buys it is saddled with the price tag of environmental cleanup, sometimes running into the billions of dollars. Likewise, environmentalists heard first hand the real difficulties of implementing regulations and continuing to make a profit. There were numerous rare moments of listening to one another—and building bridges that will be valuable for years to come.

What We Learned

Coaching, planning and a strong process paid off.

Countless hours were spent by the agency staff (who were mentioned above) planning meetings, talking to team members, recruiting speakers, and trouble shooting. Instances where team members did not feel their point of view was heard were often mediated by a staff person making sure that the person had time in a meeting to express his or her concerns. The hours were worth it in the final level of consensus achieved.

The people on the team make a difference.

Intentionally, EQB members selected individuals known for their ability to work together as the process is one of bridge building. Most team members had experience working with government and had become acquainted with members of the EQB's strategic planning committee; thus, EQB members had a sense of team member strengths. This was important. The strongest teams showed the greatest commitment, could bridge differences, were most willing

to listen, and had the greatest and most relevant expertise.

There's no reason to apologize for being a visionary.

There is a lot of cynicism expressed these days, especially when people say that government can't possibly succeed in something like this, particularly in a country with such an independent nature. But really, a part of the fun is that you are asking people to think way beyond their normal interests in a broad, visionary, way. At times, this proved to be genuinely profound. It became important to remind people that this kind of effort is slow, and is the beginning of a very long effort.

The dialogue is as important as the recommendations.

The relationships and understanding will be the basis of many future liaisons and partnerships. There is talk of increased alliances between farmers, environmentalists, and the business community.

For me, this was a project that made me remember the true meaning of public service, e.g., thinking seriously about the future and bringing lots of people along with us. At the very least, 105 people know deeply what sustainable development means in their area. More broadly, a state is creating a responsible future leading the way for the next generation.



Katherine Barton is a Planner Principal at the Minnesota Department of Natural Resources and worked with the Initiative's coordination group throughout the project. She has 10 years experience working with non-profits doing community development and five years experience doing corporate training at The St. Paul Companies. She is currently pursuing a Master of Arts degree at Hamline University with a concentration in writing.

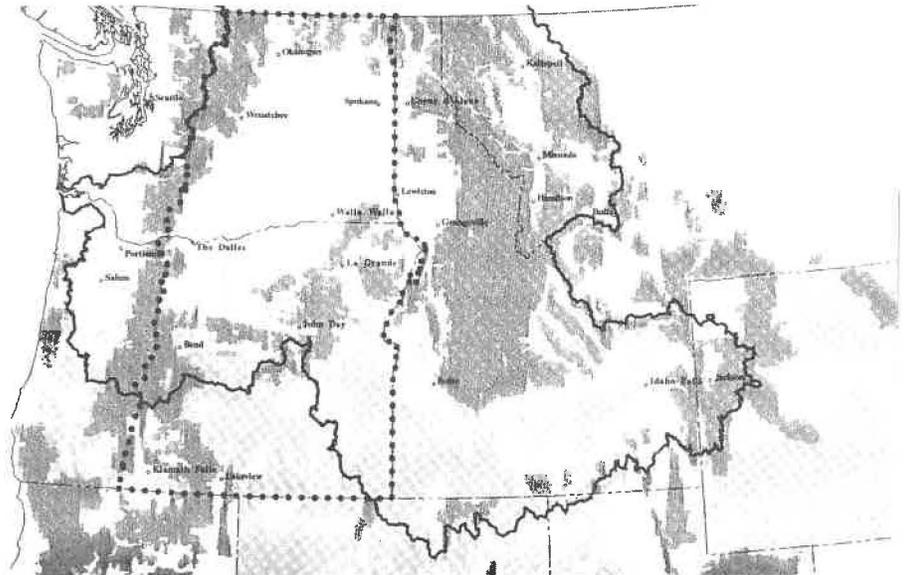
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ECOSYSTEMS DO NOT RECOGNIZE STATE OR FEDERAL LAND BOUNDARIES. SIX STATES, 19 TRIBES, AND NUMEROUS FEDERAL AGENCIES ARE TRYING TO FIND A WAY TO COLLABORATE ON MANAGING THE VAST COLUMBIA RIVER DRAINAGE AND ENVIRONS.

EASTSIDE ECOSYSTEM MANAGEMENT PROJECT

JONNE HOWER
ELAINE ZIEROTH



Following a much-publicized Forest Conference (held in Portland, Oregon, April, 1993), President Bill Clinton directed "the Forest Service to develop a scientifically sound and ecosystem-based strategy for management of eastside forests." The Eastside Ecosystem Management Project, meeting in Walla Walla, Washington, grew from that charge. The charter for the Eastside Ecosystem Management Project, signed in January, 1994, by both the Chief of the Forest Service and the Director of the Bureau of Land Management, identifies several points for resolution.

The landscape

The project covers 144 million acres of the interior Columbia River Basin (CRB) from the crest of the Cascade Mountains east to western Montana and a portion of northwestern Wyoming (see map). The southern border follows the Oregon-California line, then along the Nevada and Utah lines. In addition to the CRB, the project boundaries take in a portion of the Great Basin and Klamath Basin. Most federal agencies with jurisdictions in the CRB are cooperators on the project and have employees serving on the teams.

Accompanying the federal
VOL. 16, No. 1

effort, the six states and 19 tribes included within the project area are also collaborating. Although the environmental impact statements will only make decisions for the National Forest and BLM lands within the project boundaries, ecosystems do not recognize political lines and a complete assessment of the area will include discussion of non-federal lands.

What led to the project?

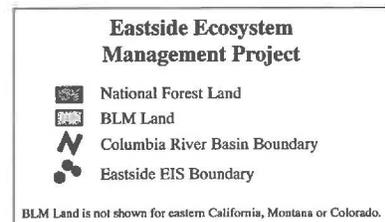
Following President Clinton's directive, the project was originally charged with developing (1) an ecosystem management framework and (2) an assessment for federal lands in two states: eastern Oregon and Washington. The framework and assessment will be used to develop an environmental impact statement to implement ecosystem management. Since that time, however, the scope and the federal holdings under consideration have both been expanded.

For the past decade, federal lands have been the subject of intense political debate. New directions in our understanding of ecosystem principles, cumulative effects, biophysical interactions, and concerns of ecosystem integrity and species vi-

ability, pointed to the need to undertake a new approach to federal land management. Furthermore, significant amounts of new information and changing conditions have occurred since current BLM and Forest Service land and resource management plans and management framework plans were signed. Shifting demographic patterns and competing human values have brought into question the role of resource use on—and management of—public lands. These systems cannot sustain the level and variety of demands currently being placed on them and still provide for biological diversity and ecosystem integrity. Perceptions of healthy, productive, and well balanced resource conditions have changed over time and the current distribution of goods and services from these lands may not reflect the values presently emphasized by the public.

Personnel

Due to the nature and time frame of the Eastside Project, team members may be assigned either for the short-term or the long-term. In addition, cooperating agencies continue to be added to the Eastside Project. Specifically, the agencies repre-



sented by team members include:

- USDA Forest Service
- USDI Bureau of Land Management
- USDI Fish and Wildlife Service
- US Environmental Protection Agency
- US Geological Survey
- National Marine Fisheries Service
- USDI National Biological Survey
- Bureau of Mines

They work for the Project as a member of one of four teams: Science Integration, Environmental Impact Statement, Communications, or Administrative teams. Agency lines blur in the whirlwind of day-to-day activities.

A fifth team, responsible for the Upper Columbia River Basin EIS is being formed in Boise, Idaho and will work closely with the Walla Walla teams. Although there will be two EISs covering the Columbia River Basin, they will be published within months of each other so that the comment periods overlap. Taken together, the two documents will address management of the Basin as a whole.

Project results are not foregone conclusions

Unlike reading a *whodunit* murder mystery where you can read the final chapter first, specific results of this project are

impossible to determine. However, it is clear from the inter-agency nature of the Eastside Project that there will be a continual blurring of agency lines in terms of management within an ecosystem. Although political jurisdictions and administrative boundaries are a reality of life for everyone, ecosystems tend to ignore them.

The Project will develop both *procedures* and *process* for collecting information in specific disciplines and integrating it into other disciplines, as well as creating a database of that information. Both the process as well as the result will be shared through-out resource management agencies. Adaptive management is a tenet of ecosystem management. It is also a tenet of *planning* for ecosystem management.

Although there are many signals which raise an alarm about the state of the ecosystems in the interior Columbia River Basin (i.e., recent listings of threatened and endangered fish, the PACFISH EA), the Scientific Assessment for Ecosystem Management in the Interior Columbia River Basin will be the first document to address the basin as a whole ecosystem. That assessment, due out in the summer of 1995, will be a "report card" of the state of the ecosystem. Based on the assessment, management strategies will be identified and analyzed in the draft environmental impact statement which is due in the fall of 1995.

Science in a fishbowl

A team of federal scientists, called the Science Integration Team, has been formed to assess the ecological, economic, and social conditions in the Interior Columbia River Basin. This assessment will support the development of Environmental Impact Statements for Ecosystem Management. One EIS will address BLM and FS-managed land in eastern Oregon and Washington; the other will address BLM and FS-managed land in the upper Columbia River Basin (Idaho, western Montana and Wyoming, and northern Utah and Nevada).

Far from the stereotype of science being conducted under

hushed, sequestered conditions, this team operates in a way that is open to observation. The Science Integration Team is providing opportunities for citizens to become engaged in the science process. They can learn firsthand about the protocols and methods used by the scientist as they integrate the best available scientific information.

Due to the wide dispersal of the team across the country, monthly week-long meetings are planned, in Walla Walla and at other sites. Typically, one day of these weeks is dedicated to science updates in a day-long public meeting. Often, too, there is an opportunity for interested members of the public to observe task group meetings.

The scientific assessment will describe the current state of the ecosystem and the trend of various components. Specifically addressed in the assessment will be landscape ecology, forest policy and economics, social science, terrestrial, riparian/aquatic, research development and application planning. Two levels of information will be addressed. One will provide information about the entire region and how it relates to the rest of the North American continent. Another will provide information at the level which is typically found in forest plans or BLM's resource management plans.

The first version of the Draft Framework

The first product of the Eastside Project, the Draft Framework for Ecosystem Management in the Interior Columbia River Basin (Version 1, May 1994) is now out for public review. Another working draft, version 2, is scheduled for publication in late summer 1994. The Framework is a tool that outlines concepts of ecosystem management. The Framework lists four ecosystem principles:

1. Ecosystems are dynamic and evolutionary
2. It is useful to view ecosystems as being organized within a hierarchy of scales of time and space
3. Ecosystems have biophysical and social limits
4. There are limits to the

Four documents: the assignment

The Eastside Project addresses policy as it relates to conservation of genetics, species, landscape diversity, and strategies to integrate public opinion into ecosystem management. The goal is to integrate the biophysical, social, and economic elements of ecosystem management.

The project staff will write and publish four documents:

(1) The Scientific Framework for Ecosystem Management in the Interior Columbia River Basin provides broad concepts and analytical processes for ecosystem analysis, planning, management and monitoring at geographic scales ranging from forest or resource management plans to regional plans. Version 1 is now out for review at this writing.

(2) A Scientific Assessment for Ecosystem Management in the Columbia River Basin Ecosystem will examine historic and current ecologic, economic, and so-

cial systems and discuss the probable outcomes if current management alternatives continue. This document will be peer reviewed.

(3) The Eastside Environmental Impact Statement will propose a broad array of management strategies consistent with the principles of the Scientific Framework for Ecosystem Management. An **Upper Columbia Environmental Impact Statement** will propose similar strategies for portions of the CRB located in western Montana, northwestern Wyoming, Idaho, Utah, and Nevada.

(4) The Eastside Ecosystem Management Scientific Evaluation of Planning Alternatives will be developed in the Eastside EIS. The evaluation will analyze the effects of implementation on tribal values and rights, and include discussion of the practicality of implementing each alternative. This evaluation also will be peer reviewed.

predictability of ecosystem patterns and processes; conditions and events may be predictable at some scales but not at others.

The Framework goes on to say that "change is inherent in ecosystems; they develop along many pathways. Disturbances influencing ecosystem structure and function are common, causing ecosystem evolution to be nonlinear and discontinuous."

When one thinks of an ecosystem like the Columbia River Basin or a subset like the Blue Mountains, there are many dynamic systems within the systems to contemplate. There are aquatic systems which have been stressed by dams, water diversions, fishing, land management, farming, and pollution. There are terrestrial systems where hundreds of plants and animals have been designated as threatened, endangered, or sensitive, and where traditional practices of logging, grazing, mining, and recreation are being re-evaluated.

There are economic systems—logging and commercial fishing to name just two—which are still reeling from the rapid growth and decline in natural resource outputs and the slow transition to other sources of income. There are rural communities where people may face major changes in the fabric and quality of their lives and communities. Urban communities like Portland and Seattle are clamoring for more control over the use of public lands. All these systems are changing and evolving and interrelating simultaneously, leaving an enormous number of possible combinations of future outcomes.

Add to this mix the advances in the fields of ecology, conservation biology, and natural resource management over the last five years. Throw in the appeals, lawsuits, and maze of interconnected laws and regulations. Consider agencies such as the Forest Service and BLM which

Women on the teams

The Eastside Ecosystem Management Project, a multi-agency and multi-state and regional project, has a broad representation of women in natural resource management. Of the total project staff, 38 (36 percent) are women. Two of the four teams are led by women. Those two women are part of a seven-member management team.

The Science Integration Team (total 45) has 14 women. The Environmental Impact Statement Team (total 18) has 6 women. The Communications Team (total 11) has 7 women. And, the Administrative Team (total 12) has 9 women.

But the story is bigger than the numbers. These women play important roles—both traditional and nontraditional—on their respective teams. Female professionals at the Eastside Project include specialists and scientists with expertise in economics, geographic information systems (GIS), public affairs, administration, ecology, plus terrestrial, riparian, and aquatic biology.

have been downsized, right-sized, and turned upside down with major paradigm shifts. Finally, toss in the dynamics of a tremendous amount of public interaction and often conflicting demands for a limited resource base. Then, you have the rationale for the Eastside Project. The project, agencies, public, and biologists all exhibit the characteristics of ecosystems. Attempts to maintain the status quo are futile.

The Framework *defines* ecosystem management as "an adaptive management, learning and planning process that attempts to ensure that people's activities and expectations are consistent with the limits and capacities of ecosystems."

There are many other definitions of ecosystem management. What is important, however, is that we change our strategies to be flexible and adaptive so that we can monitor and adjust them continually. It is also necessary to recognize the role of humans and human demands and activities within the bounds and capacities of the ecosystems themselves.

The Framework lists *characteristics* of ecosystem management. There will be:

- (1) a description of components, ecosystems, environments and interactions;
- (2) a holistic, comprehensive, and interdisciplinary process;
- (3) a consideration for people,

their values and activities;

(4) a consideration for ecosystem dynamics;

(5) a consideration of multiple scales;

(6) a delineation by biophysical and social criteria.

Previously, plans were driven by producing certain commodities and services. They were not flexible enough and ended up being outdated almost before the ink was dry. In the Columbia River Basin itself, we sometimes tried to fight the natural dynamics and disturbance factors which, in the short-term, help keep the systems stable. Forest health problems, concerns for species habitat, and the risk of major wildfire are all symptoms of our misunderstanding of disturbance regimes and system limits.

A BLM public affairs officer, Jonne Hower is currently on loan to the interagency Eastside Ecosystem Management Project in Walla Walla, Washington. She has a Bachelor's in Range Management from the University of Idaho and a Master's in Communications from the University of Portland. She is a WiNR section editor.

Elaine Zieroth is on detail to the Eastside Ecosystem Management Project as a wildlife biologist for the EIS Team. She was formerly the District Ranger on the Tonasket Ranger District, Okanogan National Forest in Washington State. Prior to that she worked in Colorado and California in wildlife, range, recreation, and research. Zieroth holds a Master's in Biology from California State University-Fresno and has been a section editor for WiNR since 1986.



Bertha C. Gillam (photo left) is the new Director for Range Management for the USDA Forest Service National Forest System. She leaves the position of Acting Director of Ecosystem Management, Environmental Coordination, and Land Management Planning. In that position, Gillam has been responsible for national coordination of policies, laws, regulations, and procedures to implement ecosystem management principles throughout the Forest Service. In her long career with the Forest Service (beginning in 1977) she has been a Range Conservationist, District Ranger, Deputy Forest Supervisor, and Forest Supervisor. She's been posted to the Black Hills National Forest, Wasatch-Cache, and the Arapaho-Roosevelt National Forests. Her Bachelor's in Botany and her Master's in Botany and Ecology are from Montana State University. She completed Range Management studies at the University of Wyoming and Colorado University and is an alumni of the Federal Executive Institute.

Diane Ronayne received The Wilderness Society's 1993 Olaus and Margaret Murie award in recognition of her 10-year contribution to the wise stewardship of Idaho wildlife resources as editor of Idaho Wildlife magazine. The national award is given annually to a state or federal employee who demonstrates exceptional dedication to resource conservation.

Ann Bartuska has been promoted to Special Assistant to the Chief of the Forest Service as the Forest Service Liaison to the National Biological Survey for coordination and collaboration. Prior to this appointment, Bartuska was Acting Director of Ecosystem Management staff (since June 1992) work-

ing to implement policy. Previously she was Wetland Staff Specialist for the Environment Research staff and had responsibilities to develop a National Wetlands Research Program and to coordinate wetlands research within the Forest Service and with other agencies and institutions. Prior to that she was Assistant Director of Southeastern Forest Experiment Station (Asheville North Carolina). She has been Program Coordinator for Acid Deposition and was a Visiting Professor in the School of Forest Resources at North Carolina State University. Her degrees are a Bachelor's in Biology (Wilkes College (Pennsylvania)), Master's in Botany from Ohio University, and Ph.D. in Biology from West Virginia University in Morgantown.

Mary Jo Lavin is the new Director for Fire and Aviation Management. She has been acting director for over a year and has more than a decade in fire management at the state and federal levels. She was a Deputy Regional Forester in the Pacific Northwest Region and prior to that was Deputy Supervisor with the Washington State Department of Natural Resources. Her Ph.D. is from the University of Colorado and she is an alumni of both Harvard University's John F. Kennedy School of Government and the Federal Executive Institute.

Christine Pytel became the new Associate Deputy Chief for Administration in the Washington Office of the Forest Service. Presently, she is Staff Assistant to Deputy Chief for Administration Lamar Beasley. Pytel's Master's is in Legal Studies from Antioch Law School (Washington DC) and a Master's in Public Administration from the John F. Kennedy School of Government at Harvard University.

She came to the Forest Service in 1975 as Equal Employment Opportunity Specialist, then became Deputy Chief for Research in 1982, then Branch Chief for Administration Management in 1984, then Assistant Director for Administration in the Forest Service Radnor, Pennsylvania office. She led the task force which created the International Institute of Tropical Forestry and has been a key player on the Re-invention Team helping to design options for new ways to operate and organize the agency.

Janice Hill McDougale has been promoted to Associate Deputy Chief for National Forest Systems. She comes to that position from being Assistant Director for Planning and Budget, for the Washington Office Wildlife and Fisheries Staff. She serves on the reinvention team as well. Prior to her four year stint with the Forest Service, McDougale worked for the US Fish and Wildlife Service for 19 years, first as a biologist with the Division of River Basin Studies in Upper Darby, Pennsylvania. She then went to FWS Ecological Services and then to the Department of Interior's Management Development Program. From there she worked nine years in the Endangered Species Program, one year in the budget office, and three years in the Division of Refuges coordinating the National Wildlife Refuge contaminants program. Her Bachelor's in zoology is from Alabama A & M and she has advanced studies in fisheries biology at Penn State.

France Cordova (photo below) has been the Chief Scientist at the National Aeronautics and Space Administration (NASA) since last October. For the four previous years, she was the Department Head of Astronomy and Astrophysics at Penn State. She also has worked at Los Alamos National Lab as a staff scientist in the Earth and Space Science Division, then as a Deputy Group Leader in the Space Astronomy and Astrophysics Group. Her Bachelor's is in English from Stanford, her Ph.D. is in Physics from the California Institute of Technology.



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Books

Reviewed by Ruth Parnall

Imagine that you are a worker in natural resources who deals every day with loss of habitat, extinction of species, depletion or diversion of natural waterways. You have come to love the choice selections made by nature when you chance upon a relatively undisturbed spot. You are wondering why your yard at home should look any different from what you know to be nature's beauty and diversity. You are trying to find books to help you figure it out.

Until recently, I would have said, "Good luck." Bookstores and catalogues are filled with volumes enticing you to erase your native landscape and replace it with a well behaved lawn and some version of Victoriana. Butterflies and birds are the well behaved wildlife invited into these garden books, if they are willing to sup on Asian, European, or horticulturally engineered plants.

Two books recently presented are long overdue. Both are authored by gardener/writers who, much to our good fortune, are recent converts to the ecological approach. They have learned, they have appreciated, and they both have the skills to spread the gospel in easily readable forms.

I do not say this to be facetious. Preserving and restoring the native habitat in gardens is not a new idea, and for those who have been doing it for years (Jens Jensen was one of the earliest), it has been something of a mission—explaining patiently, suffering lawsuits for growing "weeds," trying to be satisfied with changing the attitude of one person at a time. It was inevitable that the long tradition of ecological garden design, newly embraced, would find new voices.

THE NATURAL HABITAT GARDEN. Ken Druse with Margaret Roach. Clarkson N. Potter, Inc., New York, 1994. 248 pp. \$40.

NOAH'S GARDEN. Sara Stein. Houghton Mifflin, 1993. \$22

THE NATURAL HABITAT GARDEN is of course an exquisite picture book, beautifully produced. There are photographs from all over the country in each of the sections titled Grasslands, Drylands, Wetlands, Woodlands. They are residential gardens, botanic gardens, nature preserves. It is lush with examples of how people have done what you are imagining you would like to do.

The text is what convinces me that Ken Druse really believes in the concept. Although it is not gifted writing, it is packed with insights and ideas, free of jargon, fairly well organized. There were clearly many interviews with the right people. The co-author, Margaret Roach, an environmental author and gardening editor of *NEWSDAY*, may have contributed to the consistency of tone. Each site is given two to four pages, and while describing the evolution of each garden, someone here managed to weave nearly all of the important points into the book—why gardeners should be devoting space to habitat, how to manage a home prairie or meadow, what to leave alone, what to pull out, and ethical propagation—to name a few.

Habitat is truly the focus. You won't see or read much about wildlife other than salamanders, butterflies and birds. No matter. "Build it, and they will come" is my belief, and anything that helps people see that the first place to

bear responsibility for biodiversity is one's very own property is a step in the right direction.

Sara Stein on the other hand, organizes her book mainly around wildlife. *NOAH'S GARDEN* is a modified diary account of her dawning consciousness of a relationship with wildlife beyond birdfeeders. Once she realized that her beloved rural/suburban traditional landscape in upstate New York, with lawn and formal plantings, represented sterile inhospitability to her non-human neighbors, she began the transformation. Each chapter is a tidbit of knowledge on, for example, fruiting native shrubs, native warm-season grasses, planting a home-size prairie, just letting go. It becomes clear that wildness in the home landscape is within reach at any scale.

There is a lot of print in this volume, with an occasional nice line drawing, as in a naturalist's work. But I am a willing reader and so am not put off when faced with pages with nothing but words and narrow margins. The format should not be a problem even for grudging readers, however, because the short chapters stand alone well—they can be read out of sequence and without a great commitment of time.

In general this book has had unabashedly raving reviews. Stein's name is appearing frequently on the roster of speakers in workshops and symposia on the subject here in the East.

I know other people, though, to whom the prose seems to have been collected by paragraph, then patched together when there were enough for a chapter. One reviewer considered the tone to be rather condescending. I can say, well perhaps, but forgive it, and read for its attitude. Stein's restoration experiments are probably leaps and bounds beyond the norm in her community, and she can be lauded for doing it. She is not a scientist, but she understands that ecology is more than a style, and she includes the science in her explanations without flinching.

She and Ken Druse will reach a wide audience that will be touched by these thoughts. As advocates of residential habitat and members of the popular press, the two of them may be able to do a great service to the environment.

I would like to know if there are other contemporary books that may influence peoples' environmental thinking, or books about natural habitat in the garden in other regions of the country I invite readers of *Women in Natural Resources* to send in a paragraph or two to me (at the journal address) about books for which they can give a positive review, and perhaps there will be more on this subject in a future issue of the journal.

Ruth Parnall's degree in Landscape Architecture is from the University of Illinois. She has worked for the City of Indianapolis (Planning and Zoning), for a civil engineering firm, as a principle in her own office, in Conway Design Associates (landscape architects), and she has taught at the Conway School of Landscape Design. She has begun a master's program in botany at Connecticut College.

WENONAH SHARPE

AN INTERVIEW BY DIXIE L. EHRENREICH

W E N O N A H S H A R P E I N T E R V I E W

WiNR: Many of our readers will be familiar with your name as the co-author with your husband Grant—and sometimes others—of one or more of the textbooks they used in their college natural resources courses. Could you explain how you got into the text writing business?

Sharpe: Although we worked together on other projects earlier, I suppose the revising of the fourth edition of *Introduction to Forestry* was my first “official” collaboration. It proved to be a formidable task in the 1970s. Much of Shirley Allen’s material for the earlier editions was by then outdated as it had been written in the 1930s. I wrote and rewrote parts of several chapters, taking on much of the task of cutting and modernizing.

During the negotiations with McGraw-Hill (a major publisher of forestry textbooks) on my co-authorship, one of the editors there asked my husband Grant if I were a forester. He said “No. The last thing we need is another forester. We need someone who can write.” As you may know, only professionals in the field were considered capable of writing textbooks. I was a writer, not a forester, so my partnership had to be “validated.” After an interview with me, they accepted Grant’s judgment. I think the time was ripe for partners to receive credit for the work they do.

WiNR: The era of the 70s saw an important leap forward in public interest in forest practices. How did this ferment affect you and your co-authors as you revised the original text?

Sharpe: One can scarcely encompass in a few words how World War II, population expansion, and forestry research and technology changed the practice of forestry during that era. And then there was new light on environmental issues, which put forestry practices into sharp relief.

Rumblings of discontent could be heard above a chorus of denials that change was needed. Old and new concepts had to be dealt with in a textbook that would be useful for several years. I

feel my perspective as a well-read generalist helped in this transition. One learns the material, working on a survey text through several revisions, and of course, I had the opportunity to consult with experts.

WiNR: How did you become interested in writing about natural resources?

Sharpe: I grew up in the Okanagan Valley, near Penticton, British Columbia, where my father was an orchardist. My mother observed nature closely, so I began looking at and talking about natural phenomena at an early age. Once, after walking a mile or so through the foothill country to a weekend job I had as a teenager, I mentioned to my employer’s wife the birds and blooming shrubs I had seen along the way. “Why Nonie,” she said, “you’re quite the naturalist, aren’t you?” I now see that as a defining moment, although at the time I didn’t know exactly what a naturalist was, or that people could make nature observation their life’s work.

WiNR: Was all your schooling in Penticton?

Sharpe: Yes. I graduated high school in 1944, with my greatest interest concentrated in English literature and its handmaidens, grammar and composition. At that time no botany or other natural history courses were available, and our science studies were rather low voltage. Although we had a class called Guidance, we learned Robert’s Rules of Order—not how to choose and pursue a career.

WiNR: Did you take English and writing in college?

Sharpe: Not until later. Given my parents’ financial position, I decided on nurses training, which was relatively self-supporting. I must say I enjoyed it, and worked as an RN during the early years of our marriage while Grant was studying for his advanced graduate degrees at the University of Washington. He also worked, sometimes

two jobs. During that time we had our first four children, so we became schedule jugglers, but I recall those years as happy and exciting.

WiNR: When did you meet Grant? Was he working in natural resources then?

Sharpe: No, we first met while I was visiting an aunt in Seattle, in 1941. We met again in 1946; he was back from the wartime navy, and I was in nurse's training in Vancouver, B.C.

I tell my grandchildren I married him because he knew the names of the trees. But of course he also knew about birds, insects, and mammals—even mosses and lichens. I found all this absolutely fascinating.

WiNR: At what point did you begin collaborating?

Sharpe: Early on in our marriage, Grant began working summers as a seasonal ranger-naturalist. His urge to publish rose to the surface when he noted Glacier National Park needed a popular flower guide. He asked me if I could help him write one, and specifically, if I could illustrate. I loved to sketch, so I readily agreed, and that initiated our series of 101 Wildflower guides.

Eventually, we published these for six different national parks: Glacier, Olympic, Crater Lake, Mount Rainier, Shenandoah, and Acadia. As well as producing a line drawing of each flower, I found my grammatical and compositional skills put to good use, as we attempted to compress descriptions of the flora into brief paragraphs, sufficiently rigorous to mollify botanists, yet clear and intriguing in style. In the 1950s and 1960s, visitor-friendly flower guides seemed a revolutionary idea, so we had to walk a fine line.

These guides, now all out of print, are considered collector's items. Some of the parks are considering reissuing them.

WiNR: When did your work on college texts begin?

Sharpe: The University of Michigan offered Grant his first teaching position in 1956. While he was there, Professor Shirley Allen asked him to do the revision for the third edition of *An Introduction to American Forestry*.

After Grant returned to the University of Washington to teach in 1966, he completed his 10-year project on another textbook, *Interpreting the Environment*. In both editions I helped him write his chapters and shaped the other contributors' work into a coherent assemblage. With multiple authors one finds great variations in

styles and abilities, and these need smoothing out and blending.

WiNR: You have another one coming out in 1995, don't you?

Sharpe: Yes. Grant and I, along with Claire Hendee, former Deputy Director, USDA Forest Service, worked on the fourth edition, but now his son, John Hendee, former Dean, College of Forestry, Wildlife, and Range Sciences at the University of Idaho, has joined us, and we have recently worked our way through the sixth edition. The text, obviously much broader in scope, now bears the title *Introduction to Forests and Renewable Resources*.

WiNR: What has been your working relationship with Grant on these books?

Sharpe: He writes raw copy, I edit, and add and subtract and research to produce what I think is a rounded picture. Our whole life together has been one of working at what we do best, combining talents and covering for each other's inadequacies. Rare good luck, really.

WiNR: You never went back to nursing during these years?

Sharpe: No, but after our ninth child started school, I had the opportunity to attend the University of Washington. I majored in English, with emphasis in composition. I saw myself as a writer and editor, specializing in natural resources, not as a person actually working in the field of natural resources management.

WiNR: But you have researched and written some parts of these natural resources texts on your own, haven't you?

Sharpe: Yes. The text of *Park Management* required a good deal of effort, as all the material was new. I worked to keep the contents at a consistent level, tailored subject areas and chapters to fit with one another, and also researched and wrote certain sections. As the text targeted both students and practitioners, this required careful work.

One of the best known names with "a line on the spine" of natural resources text books is Wenonah Sharpe. She has collaborated with her husband Grant—and others—since the 1970s on a wide variety of subjects.



WiNR: Writing books is not “ivory tower” work, is it? Sometimes dealing with editors and publishers is difficult.

Sharpe: When a new John Wiley editor appeared on the scene, he ordered us to remove 100 pages of text out of *Park Management*, as well as half the illustrations. Charles Odegaard, our co-author, had just begun a new position as deputy director of the National Park Service’s Pacific Northwest Region. This meant he had no time for rewrite. Grant was equally busy with his teaching, and the task of readying the new version to meet a deadline fell to me.

But the effort was worth it. Thanks to Grant’s skillful and determined champion-

ing of my cause, I appeared as co-author on both the 1983 and 1994 editions of the book, now entitled *A Comprehensive Introduction to Park Management* (Sagamore Publishing, Inc).

WiNR: What did you mean by “championing of my cause”?

Sharpe: It was a matter of receiving credit for work done. He felt I had put a great deal of effort into the books over the years, and deserved recognition. (Ahead of his time, really, on women’s equity issues.) He encouraged and helped me to get my English degree, and when I accomplished that, he felt justified in “going to bat” for me to acknowledge my input. Grant knew we were a team. I knew we were a team. He wanted the reading audience to know we were a team. He also felt I should be earning a share of the royalties for my work.

WiNR: Is textbook writing financially rewarding?

Sharpe: No. Writing pays the publishers who take the risk economically. The sellers make a small amount on each book. The authors of textbooks at best get a few thousand dollars a year, sometimes a few hundred. The reward lies mostly in the pleasure of the task, the prestige of the accomplishment.

WiNR: What were the procedures and relationships involved with the editors of your books?

Sharpe: I can’t answer this because it is something Grant handles. It was a mystery to me—and still is. We have our separate areas.

WiNR: Are there other areas in which you and Grant work as a team?

Sharpe: There were correspondence courses available in both *Park Management* and *Interpreting the Environment*. I helped shape the courses, and for 17 years was a reader-grader. This contact with both students and professionals in parks and recreation kept me up-to-date on many issues. The University of Washington paid me the going rate for this work.

WiNR: Have any of your children become authors or editors?





Sharpe: Our daughter Kathryn has settled into editorship at the University of Washington where she edits the award-winning computing and communications newsletter *Windows on Computing*. Rosemary, in her senior year at the same university edited *Bricolage* a student arts publication, as well as *Matrix*, a monthly poetry magazine, which appeared in the U of W daily newspaper. Our son Fred, now working on an advanced degree at Simon Fraser University in British Columbia, seems to have his father's unstoppable urge to publish. So in addition to my other writing, I worked with him editing *Wild Plants of the San Juan Islands*, *Birding in the San Juans*, and on his current project, a two volume work on *Birds of the Olympic Peninsula*. Fred also writes papers in his major research area, the social feeding strategies of humpback whales.

WiNR: Do you write on other subjects?

Sharpe: I have a juvenile novel nearing completion. It deals with children spending a summer at Acadia National Park, in Maine. The major character, a girl of nine, struggles to reconcile the romantic and sentimental view of nature with the practical and scientific approach.

I also write book reviews—perhaps my favorite activity. Here remuneration consists of a copy of the book—but one also gains understanding of the subject area, or clarifies previous knowledge.

In addition, I belong to a group that meets once a month to read their poems—so I'm working on that genre with some regularity, and have had one poem published in *Douglasia*.

And genealogy interests me greatly. I've had an article published in *Heritage Quest*, dealing with the Peter Robinson Settlers in Upper Canada.

WiNR: Beyond your familiarity with the subject matter of the texts and your writing skills, what do you feel you've brought to the textbooks you've worked on?

Sharpe: The student's viewpoint, the interested layman's viewpoint. If I can't read material without pausing to clarify it in my mind, and can't logically connect it to previous material, it doesn't stay in that form, and I do the rewrite. Then, in some instances, I have had to sketch out for an author a wider presentation of views than he or she as a specialist might think to present.

I believe I also bring a sense of joy in the enterprise of learning, and in the integrating one body of knowledge with another. Perhaps these things have contributed to the educational process; certainly I hope so.

Interviewer Dixie L. Ehrenreich is Editor of Women in Natural Resources.

Photos of Wenonah Sharpe these pages: opposite, discussing interpretive methods at Mesa Verde National Park (Colorado) 1988; examining the lava cast of a tree in the Gifford Pinchot National Forest (Washington State) 1972.

This page, top, researching ice plant with surf in the background at Asilomar (California) 1976.

To the right, Lena Sharpe and Rob Reed before their deaths in 1993.

Our daughter, Lena Sharpe, (a WiNR subscriber, by the way), was an assistant producer at KCTS-TV, Channel 9, Seattle. Last year, she was awarded a grant to produce a documentary dealing with forest resources. Originally she planned to focus on old growth and its meaning in today's society.

As she researched and filmed, her scope broadened to include something about agency and industry attempts to deal with the new realities in managing forest resources.

Lena and her cameraman, Rob Reed, were killed



when their light plane crashed near Kelso, Washington, in October, 1993.

In addition to our sorrow at losing Lena and Rob, we have also lost Lena's vision of these issues. Speaking of humans, she wrote "we have assumed this huge responsibility for managing nature..." She wanted to make her film "a chance for a moment of reflection for us to see the enormity of what we've taken on."

The 6th edition of *Introduction to Forests and Renewable Resources* bears this dedication: In memory of Lena Sharpe 1964-1993. Working for understanding in forest management.

Wenonah Sharpe

ALMOST AN ISLAND

DIANE M. CALABRESE

Welcome to Pennsylvania, where the speed limit is still 55 miles per hour. That familiar greeting on Interstate 90 is hard to miss. Yet if you've always thought of the northwestern corner of Pennsylvania as the shortest—and slowest—distance between Ohio and New York, you might want to reconsider. There are reasons to slow down.

Presque Isle State Park, an inland peninsula on the southern shore of Lake Erie, deserves a long, careful look. Visitors can swim, hike or run. Picnic or canoe. Fish year-around. Relive some history. Perhaps just sit and reflect on this thumb-shaped hook of land sticking out from the flat line of the Pennsylvania shore as one of the finest remnants of the last glacial age.

I grew up on Lake Erie, and Presque Isle was the first park of any sort I knew. When I was a college student, I spent a summer studying the dragonflies there. Every time I visit my hometown, I find myself walking the peninsula: I favor the bayside to see the morning sun rise and the Lake Erie side to catch the varied sunsets.

Everyone should grow up with a park, a personal retreat. When my mind needs a rest, I conjure the soft images of aspens and mallards, sunfish and water lilies, and, of course, sand. But that's nostalgia.



Let me share a description of my friend, Presque Isle State Park—just enough to persuade you that there is a reason to slow down in Pennsylvania.

First, a few facts. Early 18th century French explorers named it Presque Isle which means *almost an island*. The name persisted, even though the French did not. An unusual remnant of the last glacial age, Presque Isle formed some 12,000 years ago when sand accumulated around rubble left by a melting glacier. Today lagoons thread through the widest section of the peninsula.

Everyone who visits Presque Isle finds that the landscape offers an array of water-related activities. On the lake side of Presque Isle, miles of guarded, sandy beaches welcome swimmers. Trails used by fitness-conscious runners and hikers wind among the trees of the bay side. Picnickers find tables and shelters in open and secluded settings. In season, visitors can course the waters in rented canoes, rowboats and peddle-boats, rewarded for their efforts by seeing darting dragonflies, jumping fish, sunning turtles, and retiring herons—all against a quiet backdrop of willows, poplars and maples.

Fishing is a year-round sport at Presque Isle. In winter, ice fisher-

men dot the frozen bay waters. Native perch and recently introduced Coho salmon are the favorites of summer fishermen; tiny smelt are tasty treats ice fishermen seek.

History books note that a well-spent seventy-five cents an acre made Pennsylvania the owner of Presque Isle and the appendage of the state (Erie County) that meets Lake Erie. The purchase from the U.S. government in 1792 settled a dispute that had stirred since the Revolutionary War: many states—some not even contiguous—claimed the land. Pennsylvania designated the peninsula a state park in 1921.

The U.S. Coast Guard station built on Presque Isle in 1876 (rebuilt 1985), reminds that the peninsula makes a natural vantage to the open border with Canada. A friendly beacon, the first light house on the peninsula opened even earlier in 1813. (Confusing to light house chroniclers, it is one of the first two light houses—the other was at Buffalo Creek—named Presque Isle Light.) Whether Buffalo Creek or Presque Isle came first is a matter of dispute. Both 1813 structures were probably oil burning lanterns atop 60 foot stone towers.)

Only a few incidents mar an otherwise peaceful history for inhabitants on Presque Isle. Profitable Great Lakes fur routes pulled the Iroquois, the French, and the English into fluctuating alliances—and even an occasional game of lacrosse in the early 18th century. As precarious as the various agreements among those groups were, Presque Isle itself emerged from that century unscathed. Fort Presque Isle, which shifted hands more than once, was not built on the peninsula but at the city of Erie across the bay.

It took a 19th century conflict to disrupt the tranquility. In 1812 the British decided to make one more quest for the Great Lakes region. Oliver Hazard Perry was sent by President Madison to meet the British fleet on Lake Erie. The problem: the young naval officer had traveled overland from Rhode Island with no ships. That was March 1813. By July 4th, however, Perry had a fleet, boats from trees hewed

on Presque Isle under the ingenious direction of Daniel Dobbins and Noah Brown. At the time, the city of Erie had 400 residents and few raw materials for ships; improvisation was the guide for the builders.

Perry left to take on the British with a fleet of five boats—two 480 ton brigs, the Niagara and the Lawrence, plus three smaller schooners, the Ariel, Scorpion, and Porcupine. Perry's British counterpart, R. H. Barclay, had only the Detroit at his immediate disposal. Barclay seems to have forfeited several opportunities to dismantle Perry's fleet: in July, for example, Perry had to haul the Lawrence and Niagara across a sandbar that blocked the Erie harbor, but Barclay overlooked the presented vulnerability.

Not until September 13, 1813 did Perry draw out and defeat Barclay. But Perry's Great Lakes' saga both began and ended on Presque Isle. After accepting Barclay's surrender at Put-in-Bay on the southernmost Bass Island in western Lake Erie, Perry returned to the Misery Bay inlet of Presque Isle, the place from which he'd set out. There, Perry's flagship, the Niagara was scuttled. In 1913, the hull—containing some of the lead that was used to hold it together—was recovered and the ship reconstructed. In 1990 the ship was again refitted. The refurbished War of 1812 ship has toured with some of the tall ships of the world, and now stands in the Port of Erie when it's not touring.

At Misery Bay a monument to Perry and a small park give visitors

a sense of the respite the setting once held out to weary lake-goers. Tranquil itself, Misery Bay is the resting place of at least twelve shipwrecks. The ravages of Lake Erie forced many ships there after they'd been damaged. Wind churns waves quickly in the shallowest of the Great Lakes—only 210 feet at its deepest. This unpredictability fascinates more than it frightens, however. There's a tide on the peninsula, far from the magnitude of ocean tides, but a tide nonetheless. Contemplative beach sitters always notice the waves.

Presque Isle has offered sanctuary of many sorts. For hundreds of years, the Eriez Indians, also known as the Kahqua, lived south and east of Lake Erie, and on Presque Isle. Agriculture sustained them.

Archaeological research on the southern shore of Lake Erie is still underway and has gaps; most of what is known about the Eriez is inferred. Like the Iroquois, they probably made dwellings of logs and used log enclosures for protection. Whether the offshoot of the Iroquois Nation was killed off, assimilated, or pushed south and west, remains an enduring mystery. But by the middle of the 17th century, the Eriez disappeared.

At the beginning of this century, a folk hero of the city of Erie took refuge on Presque Isle. Joe Root preferred lean-to shelters to urban life. City residents speculated Root was a disenchanting offspring of a wealthy family. Some imagined him a spy. Root confounded them when





he met social workers with gifts of wildflowers. The episode ended in 1912 when the state forced Root to leave and enter a mental institution.

In the middle of this century, houseboats proliferated on the inner waters of Presque Isle. Mark Gabor, the author of a book about houseboats and a tracker of them around the world, wrote that "the occupant is always aware of the environment." The notion and motion of life on the water tempts anyone. Sanitary considerations, however, restricted the boats to Horseshoe Bay in the 1990s. The confinement in no way diminishes their mystique.

The Presque Isle Nature Center, housed in a modest cabin at the entrance to the park, introduces visitors to the flora and fauna. Presque Isle provides a genuine refuge for many species that confront extinction. The lake sturgeon and Blanding's turtle are endangered. The eastern sand darter and several birds: American abittern, least bittern, upland sandpiper and Henslow's sparrow, are threatened. Plant treasures turn up everywhere. In 1987 James Bissell, a botanist at the Cleveland Museum of Natural History, found an ancient plant, the variegated horsetail (*Equisetum variegatum*), which first appeared on earth some 300 million years ago.

And there are other historical treasures still to be researched. In 1989 archaeologist James Dwyer began searching ballast of shipwrecks. So far he has only found evidence of where the ships originated. But who knows what will be found under the silt and sand of this beautiful place to add to its mystique for future generations.

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Diane M. Calabrese is an entomologist and a writer; she lives in Columbia, Missouri.

Falcon Magazine is a publication designed to bring conservation education to elementary school students, particularly fourth graders. There are four issues—with each student getting one—during the school year. The magazine is a cooperative venture between Falcon Press, a privately-owned publishing firm in Helena, Montana, and various state fisheries, wildlife, and game agencies who contribute the dollars necessary to distribute free to schools a Falcon edition tailored to their state. (North Dakota Game and Fish Department, for example, contributed \$50,000.) Falcon press also prints a national edition, which is sold on newsstands and by subscription throughout the country. The response from fourth grade teachers and students has been very positive. Contact Jean Brown at Falcon Press, 800-582-2665.

A new publication *African Crop Science Journal* seeks to share research on tropical crop science and plans to publish an issue dedicated to women in agriculture in March 1995. They will accept research papers with a broad focus including rural development and socio-economics. Contact Adipala Ekwanu, Editor, Makerere University, Kampala, Uganda by faxing 256-41 53 16 41.

Writing in *Forest & Conservation History* (July 1994) Sylvia McGrath reviewed two books on environmentalism. About *Not in Our Backyard* by Marc Mowrey and Tim Redmond (New York: William Morrow & Company, Inc. 1993) she notes that it is written in 100 short pieces; the book documents a "wide range of specific events and reaction to those events beginning with the massive oil spill from an offshore oil well at Santa Barbara, California in January 1969 and ending with a gathering of environmentalists at Huey Johnson's 60th birthday party in San Francisco." *Coyotes and Town Dogs: Earth First! and the Environmental Movement* by Susan Zakin (New York: Viking 1993) focuses "on the lives, motivations, and activities of the people who created the radical environmental group." All of the authors of both books are western journalists who write sympathetically and well about their subjects; both books are narrative and biographical, based on ex-

tensive research and interviews. Both books "offer an in-depth picture of some facets of modern environmentalism. They are not, nor are they intended to be, balanced accounts. Government, industry, and professional scientists are often the enemy in the view of these authors, especially Zakin. The authors disregard the fact that many professionals, whether in public service or private industry, also seek to protect the earth's ecosystems," McGrath concludes.

A cookbook written by the folks who were sealed into the Biosphere for two years leans on basic or home-grown ingredients. *Eating In—From the Fields to the Kitchen in Biosphere 2* (Biosphere Press, \$15.95) has 50 recipes that are light on numbers of ingredients but long on creativity and nutrition.

Women have not paid enough attention to heart disease. The *Healthy Heart Handbook for Women* is an information-filled 90-page booklet put out by the National Heart, Lung, and Blood Institute. To order send \$4.75 to Healthy Heart, S/N 017-043-00122, Supt. of Documents, PO Box 371954, Pittsburgh, PA 15250-7954. Another updated paperback is *Women and Heart Disease* (Balantine 1994 at \$10) by Edward B. Diethrich and Carol Cohan. For another, The American Heart Association (800-242-8721) will refer you to a local AHA office where you can get a copy of their booklet *Silent Epidemic: The Truth About Women and Heart Disease*.

Parenthood doesn't end when children grow up and move out but the power realities do change. In her book *I'm Still Your Mother: How to Get Along with Your Grownup Children for the Rest of Your Life* (Delacort Press), author Jane Adams offer advice such as listening carefully to their versions of family history. Children have a right to their versions of the stories. Parenting mistakes should be causes for regret, not guilt which is counterproductive. Let grown children make their own mistakes—move from player to coach or they will be crippled. Do not threaten your own financial security to be their safety net. If the child can't live as well as you did, so be it. Be a supportive grandparent, but they are not your

children, and creating a new family is a child's ultimate act of independence—so even if you foot some bills you have no right to call the shots.

Discovering the Laws of Life (Continuum Press) by Sir John Templeton is another of those secrets of leading a fulfilling life book. But he's a really rich guy and can write and publish what he likes. To wit: be grateful for what you have, be enthusiastic about everything you do, don't gossip, make sure your job is your career, realize that success is a journey, learn as much as possible from those around you, perseverance is the difference between success and defeat. Darn it, he stole the plot for my next book.

The Dean of the Fletcher School of Law and Diplomacy (Tufts University), Jeswald W. Salacuse, is an expert on solving problems. He wrote *The Art of Advice: How to Give It and How to Take It* (Times Books, New York). His book advises that it is vital for someone who is asked for advice to agree with the asker on what the role is to be. A sympathetic listener is not an adviser. Think carefully about what the other person wants from you and if you are willing—or able—to give it. Advising is developing and delivering the best solution for someone's specific problem. But you need to try to uncover that person's true concerns which means letting them talk as long as they need to, listening carefully without interrupting until they ask for your opinion. Then, suppress the urge to make your experience the center of attention. People ask your advice because they trust your expertise, neutrality—or both. That gives you power, but people expect you to use it to help them.

Failing at Fairness: How America's Schools Cheat Girls by Myra and David Sadker (Charles Scribner's Sons 1994) is one of those books that parents of girls ought to read. The authors describe the situation as it really is from the academic point of view (girls get very different treatment from teachers), from the point of view of the boys who are the peers of girls (the boys' contempt level for girls during most of their school life is unbelievable), so girls conclude that the appearance of their bodies does more for them than the contents of their minds or the ability to get a good job. The authors have some suggestions and note some places where good stuff is happening—but hey, it is discouraging reading after all this time.

The Association of Consulting Foresters of America, Inc. have their 1994-95 membership specialization directory for sale at \$18. It is indexed for their 480 members by states, language, international experience—in addition to specialties, experience, education, etc. Call 301-530-6795

Issues Quarterly (IQ) is a new publication by the National Council for Research on Women and funded by subscriptions—and additionally, by several foundations. The 18-page Volume one, number one focused on sexual harassment—of teens particularly. The council also publishes another list of publications on women. IQ costs \$35 per year from The Council at 530 Broadway 10th Floor, New York NY 10012 (212-274-0730).

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Research

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Focus on:

CANADIAN

RESEARCHERS

Toxic Metals in the Environment
Lucrezia A. DePieri
Pacific Agricultural Research Center, Agassiz, British Columbia

So far, it looks good! Preliminary results indicate that the concentrations of heavy metals in soils and crops of the Fraser Valley are well below the levels which are considered dangerous. These are the findings of a survey of soils and crops of the Fraser Valley (British Columbia, Canada), carried out at the Pacific Agricultural Research Center (PARC) in Agassiz, B.C. This is reassuring, since metals, such as copper, cadmium, molybdenum, and lead in the soil can be taken up by crops and can cause diseases in humans and animals.

The effects of the ingestion of toxic metals vary enormously depending on the characteristics of the chemical and how much is ingested. Effects vary from a mild headache to chronic kidney diseases—possibly cancer.

Toxic metals can be *naturally present* in agricultural soils or can be *introduced* as: a) contaminants of inorganic fertilizers, b) components of sewage sludge applied to land, c) airborne volatiles and particulates from the burning of fossil fuels and industrial activities, d) fertilizer micronutrients, including selenium and molybdenum, e) animal

wastes contaminated with metal elements, such as copper in swine manure and arsenic in poultry manure, f) leached material and runoff from landfills. Activities such as reclamation of lands after other uses, mining, drilling, and others may uncover toxic metals.

The research at PARC is aimed at gaining knowledge about the current levels of copper, zinc, molybdenum, cadmium, and lead in soils and crops to facilitate future monitoring and prevention of toxic metal accumulation. Preventing cadmium, a particularly toxic metal, from entering the human food chain and the environment is the aim of several projects currently taking place at PARC.

The survey was carried out in the fall of 1992 and was based on three distinct and very different soil types representing most of the range of soils present in the Fraser Valley. The major fall crops surveyed were potatoes, cabbage, cauliflowers, carrots, sweet corn, lettuce, and turnip.

It is known that the distribution of toxic metals within a plant is not uniform; for example, sweet corn leaves tend to have much higher concentrations than the grain. Since the nonedible parts of the plant are often placed in compost, however, toxic metals can be recycled back into the soil. It was therefore decided to

study the distribution of the toxic metals within the plant. The crop samples were split into parts. For example, carrots were split into roots and leaves, and sweet corn into leaves, husks, cobs, stalks, and grain samples. The soil samples were taken at two depths (0-6 and 6-12 inches) covering the zone of soil occupied by the crop root system. Soil and crop samples were dissolved with nitric acid and hydrogen peroxide in a microwave digestion system. The concentration of the toxic metals were measured by an isotope dilution method using an Inductively Coupled Plasma Mass Spectrometer.

These data will give us a better idea of the distribution of toxic metals in the environment. Preventing the accumulation of toxic metals in soils is a better management tool than trying to cure the diseases that they cause.

Lucrezia A. De Pieri is a Postdoctoral Research Fellow. She has a B.Sc.(Hons) in Applied Biology from Hatfield Polytechnic (UK), a M.Sc. in Biological Computation from the University of York (UK), and a Ph.D. in Natural Sciences from the Hatfield Polytechnic.

Research in Progress

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**Biological Control with
Mycoherbicides**
Carmen Oleskevich
Simon Fraser University

In commercial timber production areas across North America, the success of reforestation practices are often diminished by competitive native weeds. Forest weeds can quickly spread to recently harvested areas and compete with seedlings (either planted or established by natural regeneration) for water, nutrients, light, and space.

Native plants belonging to the genus *Rubus*, such as thimbleberry (*R. parviflorus*), salmonberry (*R. spectabilis*), and wild red raspberry (*R. idaeus*), are among the top ten forest weeds in Canada and are known to overtake productive forest lands in as little as one to two years after logging.

A variety of methods have been employed by Canadian forest managers in an attempt to control *Rubus* weeds and to enhance conifer seedling growth and survival. Practices such as manual cutting, mechanical site preparation, and prescribed burning have often resulted in increased *Rubus* weed spread through extensive sprouting and suckering. Chemical herbicides have been used with a certain success though high costs, rising public opposition, and new forest policies in several

Canadian provinces aimed at reducing herbicide use, have necessitated the search for alternative weed suppression methods.

One such method is biological control, the use of natural living organisms such as fungi, bacteria, and insects to suppress or control target weeds.

These organisms can cause disease in plants or otherwise disrupt the normal plant lifecycle. The use of fungi to control weeds, commonly referred to as the mycoherbicide (Gr. "mykes" = "fungus, mushroom") strategy, is increasing in popularity.

Presently, a handful of products are commercially available for selected agricultural systems. This strategy involves manipulating fungal pathogens to cause disease among specific plant populations at specific times and rates.

Mycoherbicides are living fungi "packaged" in a product form and applied in inundative amounts to target weeds with techniques similar to herbicide applications. On forest timber lands, the mycoherbicide strategy aims to constrain weeds rather than eradicate any plants that are part of the forest ecosystem.

My research is focusing on developing a potential mycoherbicide to control *Rubus* plants in reforestation areas. During the summer of 1993, naturally diseased *Rubus* leaves were collected from recently

logged forest lands throughout Vancouver Island and brought to the Pacific Forestry Centre in Victoria, British Columbia. In the laboratory, several different fungi were isolated from the diseased leaves and grown in large quantities to test their ability to cause disease in healthy target plants.

Certain fungi we've isolated from *Rubus* plants are proving to be good candidates in overcoming plant resistance to disease, especially when combined with nutrients (to provide food for fungal growth) and surfactants (to help fungi stick to plants). Once selected as a potential mycoherbicide, the fungus will be formulated to enhance survival and virulence and to facilitate application in the field. Extensive testing will also be undertaken to monitor fungal spread in the field and impact on non-target plants before any product will be released in the forest environment.

Rigorous testing is required for all potential

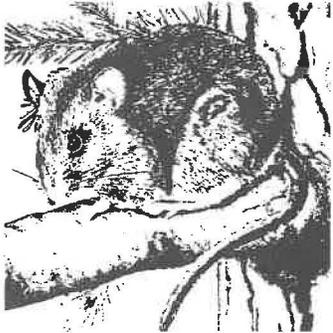
mycoherbicides before government approval is given and a commercial product is made available.

The fungi selected as mycoherbicides are normally found in the natural environment. They are subject to natural controls such as temperature, moisture, and host availability and often do not survive at above normal levels past the season of application.

Biological control of weeds with mycoherbicides may increase the success of reforestation efforts and offer an ecologically sound alternative for future integrated forest weed management practices.

Carmen Oleskevich has a B.Sc. Honours in Biology from the University of Victoria, British Columbia and is currently pursuing a M.Sc. in Biological Sciences through a joint venture between the Canadian Forest Service at the Pacific Forestry Centre, Victoria, and Simon Fraser University.





Hantavirus update

The hantavirus caused major alarm in spring and summer 1993, when it first surfaced as an unknown but lethal respiratory illness in the Four Corners states of Arizona, Colorado, New Mexico, and Utah. With deadly swiftness, it struck formerly healthy young adults, initially causing ordinary flu-like aches and pains but quickly progressed to inflict massive tissue damage in the endothelial cells lining the lungs and causing capillaries to leak. Within a matter of hours victims went into crisis, finding it progressively harder, and then impossible, to breathe. Even with the help of a ventilator, many died from blood loss. Through a combination of coincidence and quick and clever laboratory detective work that showcased the power of modern genetic techniques, researchers at the Center for Disease Control and Prevention (CDC) and the U.S. Army Medical Research Institute of Infectious Diseases were able to identify the culprit as a previously unknown strain of hantavirus.

These are a family of retroviruses already known in Asia and Europe for causing fevers with hemorrhaging and kidney disease. But the newly discovered U.S.

strain—known as the “Four Corners” or Muerto Canyon” strain attacks the lungs rather than the kidneys and is much more rapid of onset and more lethal; mortality (now at 39 out of 64 confirmed cases) for the U.S. strain is running at close to two-thirds, compared to a range of five percent to 20 percent for the overseas viruses.

Researchers have pinpointed the deer mouse as the main host for the virus, a cause for concern, because the deer mouse range stretches across most of the continental US and Canada. The CDC reports infected rodents all over the US. People seem to get the virus mostly from contact with the aerosols produced from deer mice urine, feces, or saliva. The infection can spread also through food or water contaminated by rodent excreta, or when other materials similarly contaminated come into contact with broken skin or any of the mucous membranes of the human body. So those people who work outdoors in rural areas, such as farm workers, forestry and wildlife scientists are potentially at risk.

CDC recommends those at risk use surgical gloves when handling animals, traps, or bedding. Carry detergent and water, plus alcohol towelettes (since alcohol has been found to break the lipid code of the hantavirus). Use surgical masks or respirator masks plus coveralls that can be removed before entering vehicles or houses. Cover open wounds with waterproof bandages, observe strict hygiene rules, always washing with detergent before eating, *before* urinating or otherwise exposing any mucous membranes to the potential of aerosolized hantavirus. The risk is not solely connected to direct handling of rodents. If field crews are searching for fungi in soil undergrowth, for example, they are in a potentially dangerous environment and need to take appropriate precautions.

Sandra Martin, a research wildlife biologist with the Forest Service’s Pacific Northwest Research Station who works in Kittitas County in central Washington State, believes that

the danger extends far beyond direct handling of the rodents. She notes that one of the confirmed cases was a young bird researcher working out of a remote mice-infested cabin in the southern Sierra Nevada. Martin is concerned that there is an overall lack of hantavirus knowledge among wildlife researchers. The added inconvenience of protecting oneself complicates already difficult working conditions and some rodent researchers may want to be reassigned because of the risks.

The guidelines and safeguards include sleeping in tents with floors at least 12 inches above the ground, keeping food in rodent-proof containers, disinfecting water, burning or burying all trash, avoiding cabins or other enclosed shelters that are rodent infested. There are more guidelines designed to keep mice out of dwellings such as washing dishes immediately, storing food and animal fodder in closed cans, covering openings in dwellings, applying rodent barriers around the base of buildings, three inches of gravel under the base to discourage burrowing, placing woodpiles high and distant from homes, cleaning out trash and vehicles which are potential nesting sites, and using spring-loaded rodent traps continuously. When cleaning suspected places or traps, the CDC advises thoroughly wetting the targeted area with disinfectant, wearing rubber gloves, disposing of remains in double plastic bags containing disinfectant according to local regulations.

....Suzanne Graham, *Forest Research West*, September 1994

Talk to us, not just to yourselves

Go to the library and find a copy of *Science* from, say, the late 1950s. If you’re at all familiar with the magazine, you’ll be surprised that, no matter what your background, you’ll be able to read it cover to cover. Sure, you’ll stumble over the occasional mathematical formula. But you can make sense of just about everything. Compare that experience to reading today’s *Science*. Not the news and trends sections, but the articles, the

reports of research, the multi-page clumps of information bits barely decipherable, or of interest, to anyone other than a specialist equal to the authors. Beyond the introductory trappings, it is clear, *Science* today is not for the layperson.

Although the reasons are many for the increasing specialization within science, one of the most interesting is implied by political scientist Langdon Winner. Discussing our society’s proclivity toward discovery and innovation, he writes: “To be caught selling last year’s model, even a perfectly good one, is taken to be a sign of weakness. The same is true of advancement within professional careers, including academic careers, which are predicated on a rapid turnover of shiny new intellectual products; scholars and scientists are rewarded for producing new knowledge rather than, for example, for seeking the wisdom needed to make better use of knowledge that already exists.”

The drive toward narrower and narrower fields of inquiry, though perhaps necessary and inevitable, might well be entropic. Not only is it more difficult for the non-specialist to understand the frontiers of certain fields, it is increasingly difficult for scientists to talk to each other...

In fact, the notion, often echoed by technical people unable or unwilling to explain themselves, that lay people simply cannot understand certain complex concepts and should not be part of the policy-making process, is undermined by a recent article in *Technology Review* (“It doesn’t take a rocket scientist” January 1992). John Doble, research director of the Public Agenda Foundation, and Amy Richardson, former research associate, report on an extensive study that involved educating citizens on two public policy issues that involved science. They argue that “people who don’t ordinarily keep abreast of scientific issues can quickly learn about their critical aspects and choose reasonable policy options. By and large, participants in the study made the same choices as a group of scientists.”

....Tim Steury *Universe*, Fall 1993

Alone together

If there are more “bag ladies” in Oregon these days, it’s so there will be fewer homeless women in the future. Increasingly, women in Eugene and some surrounding communities are forming small groups called BLOWs (Bag Ladies of the World). Their goal: to build sustaining relationships with other women so they can care for each other throughout their lives into old age. “We are building communities of support for ourselves,” says BLOWs member Catherine Cascade.

A gathering of women musing on the possibility that they could someday become bag ladies—or at least be alone in old age—formed the first BLOWs group about 10 years ago in Eugene. Perhaps their concerns were justified. According to the US Census Bureau, a high percentage of men over the age of 75 are married, while most women in that age group are not. Elderly women outnumber men nearly three to one. There are now eight BLOWs in Oregon. None charge formal dues, and each has about 12 members ranging in age from the late 20s to 70. Three times a year the groups get together for weekend BLOWOUTS where they share their joys and frustrations and make plans for their futures.

....Mark Wexler, *Modern Maturity*, June 1994

And furthermore, they burned a lot

It is a popular myth that prior to European contact America was dominated by impenetrable, relatively uniform ancient forests, which cloaked the landscape in a long-term, static balance with the environment. The reality was far different. Presettlement forests were dynamic, shaped by myriad natural and human influences, disturbances, and catastrophic events that profoundly affected the age and species mix both for plants and animals. The diversity of forest conditions that resulted from these influences was a major factor in creating the wildlife variety and abundance that so impressed early European settlers.

Forests both in the country’s East and West were not pristine... In the eastern forests native

peoples lived in fixed villages and practiced a maize-based agriculture. Domesticated crops commonly accounted for half or more of their diet, with the remainder provided by wild berries, nuts, fruits and wild game gathered from the adjacent forest. In addition to areas largely cleared of trees for crops, tens of millions of acres around each village were burned periodically to improve game habitat, facilitate travel, reduce insect pests, remove cover for potential enemies, enhance conditions for berries, and drive game. For example, in New England it was reported that the native peoples underburned the woods in the spring and in the fall. Roger Williams wrote that “this burning of the Wood to them they count a Benefit, both for destroying of vermin, and keeping downe the Weeds and thickets.”

....Douglas W. MacCleery, *Forest & Conservation History*, July 1994

Men use their money to buy in to a sweet deal, women use theirs to buy out

Wouldn’t it be something if the American family were finally to be done in NOT by drugs, fluoridated water, welfare dependency, Hilary Clinton or gangsta rap, but by the continued reluctance of regular guys—upstanding middle-class Republicans, many of them—to do their fair share of the housework? Linda Waite thinks it’s already happening. And she isn’t making it up to scare her husband into emptying the dishwasher; she has proof.

Waite, a professor of sociology at the University of Chicago, and Frances Goldscheider, a sociology professor at Brown University, have been analyzing data from the vast National Longitudinal Surveys of Labor Market Experience, begun by the US Department of Labor in the late 1960s. The surveys followed 5,000 young men and women and 5,000 older ones for a 15-year period to find out how we live now. Which, increasingly, it turns out, is by ourselves.

It used to be that around 80 percent of American women aged

25 to 34 were married and living with their husbands. Now, it’s more like 60 percent. It used to be that children lived at home with their parents. That happens less and less. People are living more of their lives alone, Waite says, outside of marriage, outside of families. It made her wonder what effect the new experience of living alone was having on people’s hopes and dreams and life decisions. So she and Goldscheider compared young people who lived on their own with those who lived at home with their parents and found, for starters, that it made a difference in how likely they were to marry.

Women who’ve lived on their own (and presumably had done their own housework) are less likely to marry than women who live with their parents until marriage; men who lived alone are MORE likely to marry. By doing their own housework, apparently, they come to see the advantage of having a wife.

Waite thinks the experience of learning to do housework while

living alone may also make men more able and more willing to share domestic responsibilities—but she admits that may be optimistic since, she suspects, most young men don’t actually do much housework. But, at least, they “learn to buy services.” Which is more than boys learn by living at home; Waite says we’re “raising boys to live in the 19th century, or at least the 1950s” when housework was women’s work, and boys could afford to assume that refrigerators would replenish themselves and laundry would get done without their intervention. Today, teenage boys do almost no housework at home while teenage girls do lots. (Sons of single mothers are the exception; they learn to pitch in.) Waite thinks it’s why boys live at home for longer than girls do: “They get a better deal.”

The *bargain* men and women made when they married in the 19th century probably wasn’t a bad deal at the time, she says. The man agreed to support the woman

Continued page 38

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THIS IS THE LAST PART OF OUR FOUR PART INFORMAL SURVEY OF WINR'S READERS.

WINR SURVEY: PART FOUR

KATHLEEN GRIFFIN
DIXIE L. EHRENREICH

In this fourth and last part of the information from the WinR survey, we are focusing on what respondents told us about their satisfaction, both in careers and in personal lives. There is also some information about salaries.

Turning first to career satisfaction, we endeavored to find out where happy employees worked so we broke out information in a couple of different ways. We found that, although there is a wide disparity between their numbers, the self employed (at 40 percent) and federal employees (at 36 percent) felt "very successful" and far ahead of the other employer categories ranging 23 to 14 percent (table 1). Regarding the "successful" category, those employed at private companies were the highest at 61 percent followed by a close grouping of all the

other categories at 47 to 50 percent. The "not for profit" employees were the most "disappointed" at 33 percent but there were too few of them numerically to make that useful. There was not much difference among the groups in the "disappointed" category.

We think, because of their large numbers, respondents expressed a high confidence in local government and federal employment. On the other hand, (if one excludes the unemployed) those who are "considering change" in their jobs (which includes promotions and better positions we gathered from the comments) the state/county/city employees were the highest at 14 percent followed closely by private company people at 11 percent.

We wondered if there were rough correlations between career satisfaction and personal life satisfaction. There does not seem to be (table 2). Plus or minus 70 percent of respondents who said they were satisfied in their careers said they were

"very satisfied" or "satisfied" in their personal lives. The group who were clearly unhappy with their jobs, however, had the highest "very satisfied" level at 39 percent for their personal lives; nor were they the largest group showing interest in major personal changes. So we have to rethink the connections between work and private lives insofar as success or lack of success in one re-dounds upon the other.

The survey queried respondents about marriage and children. So we asked the data to tell us if marriage and/or children made a difference in personal satisfaction—and we found that it did in the first instance and not in the second (table 3). The largest percentages of "very satisfied" and "satisfied" with their personal lives were those who were married. There was little difference in those who did have—or did not have—children.

Career Success

EMPLOYER	(Total)	Very successful		Successful		Disappointed		Considering change		Too early to tell	
		%	(Num)	%	(Num)	%	(Num)	%	(Num)	%	(Num)
Federal	193	36	69	50	97	4	7	8	15	3	5
St/Co/City	84	17	14	49	41	7	6	14	12	13	11
University	43	23	10	47	20	2	1	2	1	25	11
Private	28	14	4	61	17	3	1	11	3	11	3
Self employed	10	40	4	50	5	0	0	0	0	10	1
Not for profit	6	17	1	50	3	33	2	0	0	0	0
Unemployed	4	0	0	50	2	25	1	25	1	0	0

Personal Satisfaction

CAREER SATISFACTION	(Total)	Very satisfied % (Num)	Satisfied % (Num)	Disappointed % (Num)	Major change % (Num)
Very successful	97	38 (37)	35 (34)	19 (18)	8 (8)
Mod. successful	189	32 (61)	38 (71)	20 (37)	11 (20)
Disappointed	18	39 (7)	28 (5)	17 (30)	17 (3)
Considering change	33	33 (11)	12 (4)	24 (8)	30 (10)
Too early to tell	35	20 (7)	31 (11)	29 (10)	20 (7)

The largest group "disappointed" with their private lives at 31 percent were not married.

Is a good salary important to personal satisfaction? Probably not, according to our respondents (table 4). Those 93 persons making over \$40,000 fell into the middle of the happiness percentages in most categories. The 104 people making \$30-40,000 were the most "disappointed" in their personal lives at 27 percent while those making under \$10,000 were next in the disappointment category.

The salary and age comparisons are interesting (table 5). About 50 percent of people aged 20-32 made \$20-\$30,000, but by age 56-65, people at that age making that salary had dropped to about 30 percent. The largest group of 56-65 year-olds made \$30-\$40,000 at about 42 percent of respondents.

The most striking feature to us about the graph is the huge increase of those making over \$40,000. They almost double from about 32 percent (at age 33-45) up to 62 percent in the age 46 to 55 age group. Note also the sharp dropping off of earnings in the

Backpage Comments

There were many opportunities to add additional comments to the WinR survey and many people took advantage of it. These "backpage" anonymous comments provided insight into the feelings of respondents.

Here are selected comments on careers, private life, and what it means to be a professional working in natural resources. The editors have added, where appropriate, some of the information about the person who made the comment while filling out the survey.

A person's job needs to change as life changes. I once was a very satisfied forestry technician, married with kids, no particular career ambitions. Now I'm divorced, kids are grown, and I'm moving up very fast, able to travel, taking on many different assignments, and even more satisfied than I could have imagined 10 years ago. **USFS**

Being a public servant I know I can't expect large salaries and any perks but it would be nice if my administration would acknowledge good work and my needs. Too often we are thought of as drones and poor performance is rewarded just as good performance is—with the same paycheck. **State Fish and Game, Marine Biologist**

Job satisfaction? It requires a balance in life. If your job is everything then small failures on the job drag you further down then they ought to. A varied life gives you other buoyancy when one area of life is not going well. **Deputy District Ranger, USFS**

In this field, most people realize that the pay is low, but you do the job because you love the type of work you do, and the beautiful environment you have the opportunity to work in! **\$21-30,000 a year, City of — Parks & Recreation**

You should be happy in your work! Life is too short to spend 8+ hours a day doing something you really don't enjoy. **Asst. Ranger, "Very successful" career and "very satisfied" personal life**

There are weeks when you do nothing but maintenance or development and wonder if you have a brain and why I paid thousands of dollars for a college education when all I'm doing is sweating and breaking my back. **Technician, Dept. Natural Resources**

With more women in the field we have the added benefit of networking with other dedicated colleagues who can understand our concerns, desires, and objectives. **Na-**

PERSONAL SATISFACTION

MARRIED	(Total)	Very satisfied % (Num)	Satisfied % (Num)	Disappointed % (Num)	Major change % (Num)
Yes	(189)	38 (72)	41 (77)	11 (21)	10 (19)
No	(160)	28 (44)	29 (46)	31 (49)	13 (21)
CHILDREN					
Yes	(93)	38 (35)	34 (32)	16 (15)	12 (11)
No	(257)	33 (84)	35 (89)	21 (55)	11 (29)

Personal Satisfaction

Salary in \$	(Total)	Very satisfied	Satisfied	Disappointed	Major change
		% (Num)	%	%	%
<10,000	(12)	33 (4)	8 (1)	25 (3)	33 (4)
10-20,000	(35)	34 (12)	29 (10)	14 (5)	23 (8)
20-30,000	(94)	37 (35)	39 (37)	16 (15)	7 (7)
30-40,000	(104)	30 (31)	34 (35)	27 (28)	10 (10)
>40,000	(93)	33 (31)	37 (34)	19 (18)	11 (10)

over 55 age group. Two of our lowest salary categories essentially disappear and everybody makes over \$20,000 by the time they are 46 years old. By the time our respondents reached age 56, as many made over \$40,000 as did those who made under \$30,000.

So how do we sum up the natural resources woman circa 1992-1993 given the data and the "back-page comments" we have shared with you from our four-part non-scientific survey? Well, of course we can't "sum up" but we can leap to print with some of the conclusions and assumptions we came to while analyzing the data.

From the survey answers we presented in this issue and the three earlier ones, we can tell you that our largest group of subscriber-respondents worked in some forestry-related

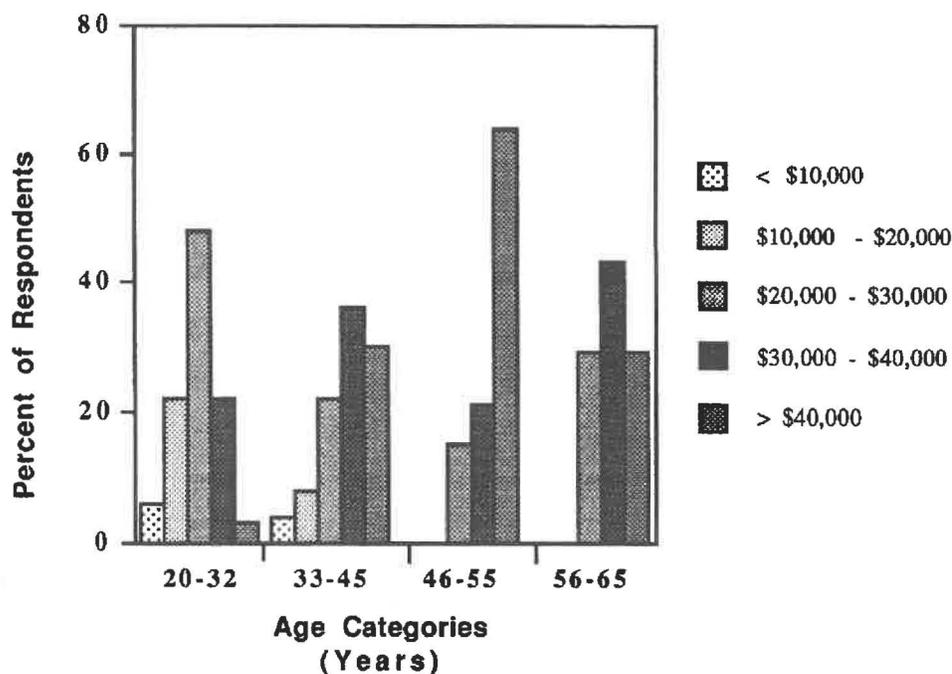
discipline. It is evident that women in that period voted with their feet and ran—not walked—into the federal sector (especially the Forest Service) because there the (1) welcome sign was out due to various court orders, laws and regulations, (2) the salaries (and benefits) were decent enough, (3) upward mobility was very possible for this group who were largely between the ages of 20 to 45, (4) they believed their work was personally satisfying and fulfilling, (5) these women were more than well educated enough to do the work—half of the respondents had master's or Ph.D.s—and they expected promotion, (6) they re-located often to accommodate the job, (7) a majority experienced harassment along the way, but harassment is diminishing, (8) they many times have chosen careers over marriage

and/or children—since two-thirds of respondents did not have children, (9) they recommend their lifestyle to others, (10) there is little correlation between job satisfaction and personal life satisfaction or between salary and happiness, (11) they often are critical of other federal agency employees who feel that traditional male jobs belong to males, (12) they spend their working days mostly in offices or office/field combinations and most have supportive supervisors, (13) most belonged to a professional society, (14) in their five year plans, most indicated they were ready for more responsibility/promotion yet *clearly* indicated they needed more free time, family time, and educational opportunities, and finally, (15) more than half complained of a too heavy work load but described their work as socially responsible, with good growth potential and good colleagues.

We want to thank the respondents who took the time to answer the 50 questions and who wrote the pithy comments, some of which we have shared. We probably will do this again.

At the time of this writing Kathleen A. Griffin taught General Ecology and Wildlife Management at Central Washington University, Ellensburg. Her Bachelor's in Wildlife Management is from Humboldt State University and her Master's in Wildlife Biology is from Washington State University.

Dixie L. Ehrenreich is the Editor of Women in Natural Resources.



Backpage comments

continued

tional Park Service, 80 percent of workplace colleagues are women

You better like what you do or you aren't happy. **Chief Ranger, National Park Service**

We as women are often in dysfunctional systems that do not support us. We are fortunate if we find "pockets" of support where we work. **<1% women colleagues in the workplace, Community Forester**

I find it very difficult to cut my work load to spend more time with my baby. My supervisor is great—it's me that's the problem. I try to be superwoman. **33-45 yr old, married, with 9 month old child, making \$31-40,000 a yr, USFS**

I sometimes worry about what I sacrificed personally and as a female to be relatively successful in this field. **Regional Manager, Industry**

We suffer from "government -bashing" which is very popular these days! **District Ranger, USFS**

The place you live very often has as much influence on your life as either family or job. You can change any one of the three if you want to. **Non-married, no dual career considerations, no children, USFS**

Balance between my career and family commitments is crucial to satisfaction, sanity, performance in all aspects of my life. **"Very successful" career, "Very satisfactory" personal life, US Fish & Wildlife Service**

Positive feedback is a management tool too little used. **State Dept. of Natural Resources**

I've succeeded because I've played the game—I haven't made waves. Sad, eh? **"Very successful" Fire Officer**

Am just realizing what I've given up family-wise by going with my job choices. **Non-married, no dual career considerations, "Moderately successful" career, "somewhat disappointed" personal life**

In my age group as a female, it is very hard to get promoted. I represent a real challenge to males who are older and more traditional than I am. **46-55 yr old Hazardous Materials Manager**

The pressure to address the whole environmental situation is increasing daily but budget cuts and personnel cuts make doing quality work impossible. Everyone is getting burned out and the quality of our work and our reputation are decreasing. So there is much less job satisfaction. **Forester, USFS**

I yearn for more women colleagues in my field. **Professor of Biology and Environmental Science, 30 percent of colleagues are women**

I am amazed that I am successful at all. But another part of me is angry, as I suspect that I could have been successful at a younger age, if I had access to mentors. And success is hard to define—success by male standards in a male dominated world? What are feminist standards of success? **33-45 yr old, career success "too early to tell"**

Career success has made fundamental changes in my personal relationships. I want more out of my friendships, especially my spouse. I also want more independence. What happens when a woman who has said yes for many years, suddenly says no? **"Making major changes" in personal life**

What do I like least about my job?...Mosquitoes in summer! **Environmental Analyst**

To your question: if you could find a similar job elsewhere, you'd take it because...? I wouldn't take it unless it offered substantial monetary/responsibility rewards—then it wouldn't be similar, now would it?! **Programmer/Analyst, Industry**

I have a perfect job! **Endangered Species Biologist, Not for Profit Organization, "Satisfactory" personal life**

Opportunities to make a contribution to socially responsible change and for personal and career growth influence my job satisfaction the most. **Equal Opportunity Specialist, USFS**

I feel fortunate to work in a field where we can make a difference. **Deputy Forest Supervisor, USFS**

If I had it to do over again I'd have spent more time with my kids when they were young. **"Satisfactory" personal life, "Very successful" career, University Professor**

The way a woman is treated at work potentially can affect her self-concept and ability to succeed both on and off the job. **Environmental Coordinator, USFS**

The agency I work for needs to change faster than the administration and bureaucracy will let it. I am not patient enough and this is a major source of frustration. **"Very successful" career, Fisheries Program Leader, USFS**

Anything is possible if you work hard enough for it! **Career success "disappointing," Forestry Tech., USFS**

Why don't I belong to a professional society? Traditional professional society in forestry is too backward and sexist. **"Very successful" Natural Resource Team Leader, USFS**

I cannot emphasize enough how important on-site, quality, daycare is to my dedication to my job. It creates loyalty, simplifies an already hectic life, and provides me with peace of mind. This all leads to a focused and energetic employee. **"Moderately successful" Technology Transfer Specialist, USFS, with a "Very satisfactory" personal life**

Job satisfaction?...I came to a point in life where I decided it was too short to mess with anything that causes undo stress. It's amazing how many "have to do's" have been eliminated in my life. I'm much happier for it. **USFS**

I love my job. I'm not advancing but I don't want to. I'm having a hard time with this because in my mind, I correlate success with advancement. **33-45 yr old, married, with children**

I have lots of untapped potential. **20-32 yr old, Technical Editor, Private Company**

Things are slowly improving as the "good old boys" retire and are replaced with a more open-minded, diverse workforce. **Wilderness Ranger, USFS**

I think I'm still expected to "pay my dues" for a couple of years before my demands are listened to. **33-45 yr old, 2 years with National Marine Fisheries Service**

My standard axiom the last few years (yes, this is cynical) is that "Careers last. Relationships don't." Men are intimidated and threatened by a woman with a Ph.D., especially in personal relationships. **33-45 yr old, University Assistant Professor**

I wouldn't go back to the low pay and frustration I experienced working for the government. But I do terribly miss being able to work as a professional in my chosen field. **Environmental Specialist with private company making more than \$40,000**

in exchange for housekeeping services, sexual access, child care, and taking care of the relatives. The terms of the bargain shifted radically in this century: most married women took outside jobs, but most married men continued to avoid housework.

Unfair but not, Waite says, surprising. One way people cushion the shock of gender role shift is by clinging even tighter to the symbolism of their traditional roles. A mom who's a university dean may make even more of a point of never missing her kids' school plays; a husband who earns less than his wife may be even more insistent on mowing the lawn but not washing dishes.

The inequities can't last. According to the National Longitudinal Studies, in the 1970s, women who could afford to maintain their own households were already less likely to marry, while men were more likely to. Women with the economic resources to live alone were using those resources to buy out of marriage, Waite concludes, while men with similar resources were using theirs to buy in. Which makes perfect sense as long as marriage is a better deal for men than for women. The eventual result, she says, could be a "no-families future, in which few marry and have children, and many live alone outside of families altogether."

...Patricia McLaughlin, Universal Press Syndicate, September 4, 1994

And the winners of the prizeless contest are...

In the newsletter, *PNW Science News*, from the Forest Service's Pacific Northwest Research Station, the editor has been running "anonymous prizeless contests," inviting readers to send in their ideas of how to finish-the-sentence that is printed in the newsletter. In August 1994, the editor printed these responses which came in from a request to provide endings to the following: *Evidence that women scientists at PNW are given respect, treatment, and opportunities equal to what is accorded their male colleagues is...*

1. "Uneven at best.... While there are women team leaders and independent scientists, the Station once again draws a blank in women program managers. Women scientists are vastly outnumbered by their male colleagues and never seem to appear in the high-profile teams and special groups assigned to national tasks."

2. "I'm not sure they really are!"

3. "In a word, lacking... The good old-boys network is still the driving force here in the Station. By remaining in their comfort zones, the boys continue to network amongst themselves... Examine the fate of women scientists to date in the PNW. Consider the composition of Station Leadership Teams (the real members that go to to ALL the meetings.) It is an enculturation process that is difficult to counter. Even the boys in the younger

generation are part of the enculturated... I do not feel compelled to stay at PNW any longer than I have to."

4. "Pretty slim."

...PNW *Science News*, August 1994

The Japanese are spending big yen on deep sea research

Although oceans cover about 70 percent of the earth's surface and are crucial to life on the planet, only about 120 years have passed since serious oceanic research began. In 1872, the first, the British ship *Challenger* set out on an around the world voyage to conduct oceanic research. The new Japanese vehicle *Kaiko* (Sea Trench) is carrying on the traditions of the later British ship *Challenger* (1951), the Soviet ship *Vityaz* in 1957, and the US bathyscaphe *Trieste* in 1960 in studying deep trenches.

In ocean, sunlight reaches down to about 200m, and pressure increases by 0.1 atmospheric pressure per meter. Dry land reaches an average of about 840m above sea level, but the average sea floor is about 3,800m below.

The history of deep waters research below 300m is very recent. In 1983 the Japan Marine Science & Technology Centre (JAMSTEC), an arm of the Science and Technology Agency, began research using the *Shinkai 2000* submersible, which can dive to depths of 2,000m. Its successor, the *Shinkai 6500*, went into service in 1991 and can reach 6,500m. Research conducted using these manned vessels has contributed a great deal to broadening our knowledge of the deep sea. Among the findings was that many species gather around vents in the sea floor that channel hot or cold water rich in hydrogen sulfide, which on land is generally toxic. Scientists discovered that some species carry in their guts a special bacterium that can process hydrogen sulfide into carbohydrates. JAMSTEC also discovered a kind of microorganism that can break down crude oil and PCBs, an attribute that no land microorganism has.

The earth's surface, including the sea floor, is made up of many crustal plates. Where one plate sinks beneath another, it creates a trench, and in trenches the oceans reach their greatest depths. The Mariana Trench, the deepest, lies where the Pacific plate sinks under the Philippine plate. JAMSTEC designed *Kaiko* to go there, and five large manufacturers (Mitsui, Mitsubishi, Kawasaki, Sumitomo, and Fujikura) constructed it.

Light and radio waves cannot reach deep waters so sound is the only possible medium of communication, but it travels at 1,500m per second in seawater, too slow (seven seconds) to reach the trench and offer navigation assistance. *Kaiko* is a two-part structure therefore, with the Launcher connected by a cable to the mother ship and the Vehicle, a moving base, connected to the Launcher by a 250m secondary cable. The Launcher cannot move itself, but carries cameras, sonar, and other equip-

ment. The Vehicle can move itself with power supplied by the mothership through cable. Along with acoustic research equipment and cameras, it has a pair of manipulator arms to collect specimens from the sea floor. It can also assist rescues from manned operations.

To date it has cost some \$52.8 million to build and has been in testing since 1993. *Kaiko* has taken pictures of the marine environment at about 10,910m deep, but further improvements need to be made to the cable connections between the vehicle and its support ship before it goes again in January 1995.

...Kenkichi Hirose, *Look Japan*, July 1994

Accurate fish counting is important to those who use numbers to justify their science

A total of 42 people are employed as fish counters at the big dams on the Columbia and Snake rivers, according to John Loch, fish passage supervisor for the Washington Department of Fish and Wildlife. During salmon migration season, human fish counters staff the counting windows 16 hours per day and for shorter periods during other times of the year. The Army Corps of Engineers and the Bonneville Power Administration fund these programs.

"The people who are doing those on-site counts are extraordinarily good at what they do," said Mathew Schwartzberg, scientist with the Columbia River Inter-Tribal Fish Commission (CRITFC). "But the system we've developed has many advantages and would be superior at many counting sites." Since 1986, CRITFC scientists have been testing a video fish counting system at Tumwater Dam on the Wenatchee River in Washington. They also conducted a two-year test at Lower Granite Dam on the Snake River which concluded in 1993.

Douglas Hatch, another scientist on the project said the early system had limitations. But gradually the team figured out the right combination of lighting, background, and video instrumentation to produce high quality video tape images of the fish as they swam past viewing windows. They use a surveillance camera much like those used for security in banks and convenience stores. The camera clicks off 1.66 frames per second, producing a time lapse record that technicians can scan much faster than the time required for on-site counting at the dams. In tests, CRITFC technicians viewing video tapes were able to complete 24 hours of fish counts in just four hours, Hatch said.

On-site human fish counts covered only 16 hours per day and humans took 10 minute breaks every hour. They then estimated the number of fish during the break. "A key factor is that they don't count at night, but some fish move at night due to fluctuations in temperature, water flow and a variety of other factors.

The ESA listings of some salmon stocks have made the night count more important. We found that some of the Snake River sockeye moved during the night as well as during the on-site counter break periods," said Schwartzberg. The tape also permits technicians to freeze a frame to further identify fish with certainty and gives biologists an opportunity to measure, look for predator marks, recheck at later dates, and record other data.

The cost is much lower—about one third of the amount spent funding the regular fish counters. That cost could be reduced even more through the use of a new computer program written by the CRITFC team. The program compresses the video record by re-recording the tape and filtering out frames in which no fish appear. "Conceivably, we could reduce several hours of tape to just a few minutes of viewing time depending on how numerous the fish are," said Schwartzberg. So far, however, the Army Corps and the Bonneville Power Administration have shown only limited interest in the project.

...Peter Gillins, *Wana Chinook Tymoo*, Issues Two and Three, 1994

Kids in one-parent families are doing well, contrary to rumor

In Alan Adcock's study, the Oregon State University researcher (and chair of Human Development and Family Sciences) says that "some people argue that economics is the most important factor for raising successful children and others say family structure—basically the two parent family—is all that matters. We're saying both those points of view miss out. How well family members communicate—eating meals together, helping with homework, sharing chores and showing support—has more effect than household composition."

With fellow researcher David Demo of the University of Missouri, the two wrote a book *Family Diversity and Well-Being* (Sage Publications 1994) and based their conclusions on a University of Wisconsin study financed by the federal government in 1988. The survey included interviews with more than 13,000 randomly selected families nationwide.

Their studies contradict other studies that show children of divorced parents to be much more troubled than those in intact families. Adcock said that's because the other studies have looked at households where children were in therapy or counseling—because they *already* had problems. There was little evidence to show that children in nuclear families are necessarily better off than their counterparts in non-traditional households. The main benefit from a two-parent family may be greater economic security, but lack of conflict is more important to children.

...Associated Press, August 1, 1994

Virginia Tech Forestry & Wildlife moves up to college status

The College of Forestry and Wildlife leaped into being at Virginia Tech (Blacksburg) on July 1, 1993. Until then, it had been a school in the college of agriculture. The new college had its beginnings in 1925 when the first extension forester was hired. In 1959, the Department of Forestry and Wildlife was established. It became a division in 1969 and a school in 1976.

The college serves 135 graduates, 700 undergraduates in three departments: fisheries and wildlife sciences, forestry, and wood science and forest products. There are 70 faculty including those in cooperatives with the Forest Service, US Fish and Wildlife Service, US National Park Service. The budget is \$12 million which includes more than \$4 million in external grants. In addition to the departments there are other units: Quantitative Studies Lab, Center for Forest Products Marketing, Biobased Materials Lab, Commonwealth Center for Wood Science and Technology, Loblolly Pine Growth and Yield Research Co-op, and the Industrial Forestry Operations Co-op.. It is also affiliated with the Virginia Agricultural Experiment Station, the Virginia Co-op Extension Service, and operates the 710-acre Reynolds Homestead Forest Resources Research Center in Patrick County plus a 1,200 acre forest "outdoor lab" near the campus. The dean is Greg Brown.

...College of Forestry and Wildlife Resources, Virginia Tech (nd)

Restoration & Management Notes

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The Eastside Ecosystem Management Project (described in WiNR beginning on page 19) welcomes citizen participation. There are many opportunities to be involved in these developments. For specific information about meetings, documents, or other information, contact the Eastside Ecosystem Management Project, 112 East Poplar, Walla, WA 99362 (509- 522-4030).

For further information about Minnesota's sustainable development planning process, (described on page 13) you may contact Katherine Barton for information at the Minnesota DNR, Office of Planning, Box 10, 500 Lafayette Road, St. Paul, Minnesota 55155-4010 (612-297-3359).

The Association for the Study of Common Property will hold a meeting in May 1995 in Bodo Norway. The themes are sustaining biological and cultural diversity and the role of knowledge and institutional innovations as related to common property resources. Contact Erling Berge in Norway for registration materials by faxing 47-64-94-8390.

International Rangeland Development is the title for a symposium which is meeting with the Society for Range Management's annual conference February, 1995 in Phoenix, Arizona. To submit a paper or get information, contact Jeff Powell, Dept. of Range Management, University of Wyoming, Laramie, WY 82071 (307-766-5164).

California Politics for Resource Managers will be offered at UC Davis November 14-18, 1994 at Riverside. The \$755 fee includes books and course materials. Call 800-752-0881 to enroll or for information.

The Spirit Lives is the title of the 6th national Wilderness Conference to be held in Santa Fe, New Mexico, November 14-18, 1994. Sponsored by many US agencies and the Society of American Foresters, it will celebrate the 30th anniversary of the Wilderness Act and examine its original intent. Contact SAF for registration materials at 5400 Grosvenor Lane, Bethesda MD 20814.

The Western Section of the Wildlife Society is sponsoring two sessions of the Natural Resources Communication Workshop to be held at California State University-Chico on January 9-13 and January 17-20, 1995. The course costs \$400 and is hands-on to help planning and preparing presentations. Contact Jon K. Hooper at 916-898-5811 for information.

The National Wildlife Federation announces the Resources Conservation Internships 1995 for college graduates with

natural resources degrees. The work is in Washington DC working on agency compliances and other legal issues. There are two deadlines and several application requirements. For full descriptions write Nancy Hwa, Resources Conservation Internship Program, NWF, 1400 16th St NW, Washington DC 20036-2266.

The *Journal of Women and Minorities in Science and Engineering* seeks submissions for its first year of publication. They will publish peer-reviewed papers that report innovative ideas and programs, studies, and formulation of concepts related to the education, recruitment, and retention of underrepresented groups in science and engineering. Issues will address the entire professional and educational environment. Cost for institutions is \$75, individuals \$40. Contact Kathy Wager, VPI, 10 Sandy Hall, Rm 10, Blacksburg, VA 244061-0338 (703-231-6296).

The Park Service is asking for public comment on its draft of a Climbing Management Plan. The plan is the focus of intense local and national interest among climbers, American Indians and environmental groups who all revere the nation's first monument, Devil's Tower (Wyoming). It is sacred to American Indians who view the increasing climbing as sacrilegious. The plan outlines six alternatives from *no* climbing to *unrestricted* climbing. For a copy call 307-467-5283.

A new organization called BLOW has been started in Oregon by small groups of women who want to insure that they have the support of each other and places to live as they age. If you are interested in finding out about the Bag Ladies of the World organization

contact them at PO Box 1582, Eugene OR 97440.

The Association for Temperate Agroforestry will hold its 4th Biannual meeting in Boise, Idaho July 23-26 1995. Focus for the papers and posters will be generally—but not limited to—temperate zone agroforestry in North America and world-wide. The first call for papers will be issued in October 1994. For information about presentations or posters contact program chair Linda Hardesty, Department of Natural Resources, Washington State University, Pullman WA 99164-6410 (509-335-6632) or conference chair John Ehrenreich, Range Resources, University of Idaho, Moscow ID 83844-1135 (208-885-7600).

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