WOODLANDS, WATERWAYS AND MOTHER NATURE

Leisurely Lessons in Ecology
For
Outdoor Enthusiasts

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Dedication

This book is dedicated to my wife
Nancy ..
Who tolerates my many days in woodlands and fields,
And on lakes and streams;
And also tolerates my many toys,
more expensive than those of boys:
fishing rods, sporting arms, and canvas pants;
boots, waders and the like,
as well as computers, a gps, a microscope, and
the beagles
we've owned over the years!

ACKNOWLEDGEMENTS

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Thanks are also due my life long friend and now Montana resident Knute F. Lang Jr. who allowed me ten years access to his lake-side cabin in upstate Pennsylvania which served as my base of operations for many of the tales told herein, and to the late Paul Strzelecki who first introduced me to the streams, rivers and lakes of Yellowstone country.

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PROLOG

Collected herein is a series of short essays designed for the casual reading – and edification – of outdoors-oriented folks, be they anglers or hunters, hikers or campers, or students of basic ecology.

This is a book you can pickup and set down at will – bedside reading, for example. There are tales on these pages of life in the outdoors, in part of the hunter, angler, hiker, or camper, but more of the wildlife that may be encountered during outdoor adventures. Each chapter is a collection of tales around a basic theme. Some take the reader to remote mountain streams in Pennsylvania, and others to the unique trout waters of Yellowstone National Park - and one to the coastal salmon rivers of British Columbia.

There are tales of ice covered lakes and snow covered woodlands, of spring time trout streams and autumn farm lands. While each starts and ends with an outdoorsmen's tale, those flanking paragraphs are wrapped around a more important middle story, most intended to increase one's appreciation and understanding of the wildlife encountered.

It is a book I hope will be made available to our youth, who in this technical age are often disconnected from the natural world. Their formal schooling may teach them of the plight of the rainforest or of the concern over whales, while they know little of the natural world in their own local parks and wood-lots. This book will not solve that problem, of course, but it hopefully can help lead to a better appreciation of the outdoors. It will be no substitute for true outdoor experiences, but may provide a starting point for a few.

Finally, the serious student of the environment – of the old-fashioned kind of ecology – will find in this book many examples of the inter-relationships between organisms and their environment. For example, what's the natural relationship between hunter, hound, cottontail rabbit and groundhog? One might find more ecology in such a tale than might be expected. And how

about the beaver and his dam, the fish, the trees that the backed-up water drowns and the change in habits of not just the angler, but the wildlife that must adapt to the new ecosystem?

There are many such stories in this book. Note, also, that the end of each chapter some “mind-tickling” questions are posed, the answers to which may be found at the end of the book.

I have spent a good part of my years on this Earth split between the great outdoors and the biology classroom, all the time carrying new knowledge back and forth between the two. Here’s hoping this book on the outdoors enhances your appreciation of the outdoors.

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Gilbertsville, PA

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Chapter I

IT'S WINTER: DRESS UP AND GET OUT THERE!

A favorite Christmas card verse of mine goes, in part, like this: "There is a quiet in the winter woods, a silence that the soul alone can hear." If you have ever been in some woodland during a snowstorm, and yourself quiet, you have heard the silent hiss of newly falling snow striking the crispness of an older blanket of white on the forest floor. Perhaps you were near a stream, and a winter breeze had overhead branches of the leafless tress clacking together, a drum beat that was syncopated with the ripple of cold water over river stone. That's winter in a woodland or on a waterway.

Winter is, however, a time when Mother Nature can be observed in what may seem her starkest dress. In reality, there is a great deal of ecology to be learned from the winter woodlands and waterways. The migratory critters flee this season, but the hibernators and winter sleepers (and there is a difference) survive until spring in torpor. A few, like our species, endure it by various means. Birds and mammals that stick around for the cold and snow change their behavior and cellular functions to survive. Smaller critters, such as the insect kind, even secrete antifreeze into their bodies. We don winter clothes and, if we choose to be out there with Mother Nature, strap on snowshoes or cross-country skis for our outdoor adventures.

Since a year begins in winter, so does this book.

Hunting is more than just hunting

On the last Friday of a flintlock muzzleloader deer-season some years ago Mother Nature dished up another odd combination of weather, both actual and forecast. The final Saturday was to be one of unseasonable warmth but sustained rain, so it was especially urgent to take advantage of the Friday forecast that made a promise of crisp temperatures and no rain even though overcast skies were in the offing.

But that Friday forecast went quickly askew, as a very light drizzle – and a tiny hint of sleet – fell intermittently as I sat sheltering the

flintlock's flashpan in the predawn hours in the forest. I was positioned just fifty yards or so from the edge of a small but dense hemlock swamp. In years past I had experienced deer moving from the swamp uphill through the woodland to a clear-cut that is now about twenty years old and thick with regeneration.

So shortly after sunrise when some heavy rustling sounds came from among the hemlocks and laurel in the swamp, I prepared for the possibility that my anticipation of deer would come to fruition. But muffled canine yips and the sound of splashing water had me suddenly wondering if I was about to face some feral dogs out on a morning jaunt – not a welcome concept with just a flintlock long-gun at hand.

That thought was short lived, however, when out of the swamp came two red foxes running faster than any I had ever observed. The behavior was a mystery at first, for they did not appear to be chasing any prey. It quickly became apparent that they may have been the quarry, for not far behind them a large coyote trotted out from among the hemlocks and nosed its way along the foxes' trail.

Such was just one more event in the world of wildlife experienced over the years within perhaps a quarter mile of where I sat that morning. I have often spent time in this woodland which is part of a larger tract of state land that has saved some semblance of wilderness in an ever-developing mountain region.

It was perhaps a decade before when an October morning found me in a tree-stand uphill and some 300 yards away from where the above mentioned event occurred, this time in pursuit of deer with the bow. Emerging that morning from the same swamp was a nice size black bear. It worked its way uphill totally unaware of my presence above it. It was a year of a good mast crop, and nearly right under the tree-stand the bear dropped to its belly, splayed out its legs, and began using its front paws to flip some of the acorns into a breakfast pile. After feeding on just a few of them – and probably because human scent had spun downward on a warm autumn breeze – it jumped up and ran off into the clear-cut.

Somewhere in the years between those two events a warm May sunrise provided a nice gobbler-hunting morning in the same area. The squirrels were active that day, and you know what pesky little detractors they can be. Two younger members of the bushy-tail set apparently had not yet fully honed their tree scampering skills. While chasing along a branch high in an oak tree, one attempted to pounce playfully on the other, causing the lead squirrel to lose its balance. What happened provided a woodland circus act.

The lead squirrel in the original chase found itself hanging from the branch, clinging only by its front paws. The second squirrel dangled comically from the rump of the first, preventing number one from pulling itself back up. Eventually it lost its grip on the tree, and both fell to the ground. Apparently no harm was done, as both bounced, rolled upright, shook themselves a little, and raced off again to continue their little game.

Many other natural events have occurred in this forest over the years, but this is offered just to reflect on the kinds of things we may experience that are adjunct to the hunt. Events like these are seldom viewed by non-hunters, and a life-time of hunting provides an ever increasing bank of such memories. And they lead, over time, to a profound appreciation of the natural world and an equally profound desire to preserve it.

It is why we all need to continue to support hunting, to encourage younger hunters, and to trek youth into the woodlands and onto the waterways in pursuit, in some part, of Mother Nature.

Natural Facts

Squirrels are high-wire athletes, but sometimes they do fall. A greater hazard than falling is crossing roads where squirrels meet their fate in huge numbers.

Coyotes are extremely adaptable and use a wide range of habitats including forests, grasslands, deserts, and swamps. They are typically excluded from areas with wolves.

Bear "nests" seen high in trees are not nests at all, but are usually a place where bears are feeding on acorns in the tree tops.

In the Great Smokey Mountains the European wild hog is one of the most direct threats to the black bear. These pervasive intruders feed on the acorns and other mast that is a mainstay in the bear's diet.

Hoofing it around on snow is a weighty matter

On an off-day, a January Sunday a few years ago, I was trooping through a woodland scouting for deer tracks and other signs of life in a snow-encrusted forest. The white blanket was a bit deeper than it had been in previous years, and I was soon wishing I had taken the trouble to haul my snowshoes from home to cabin. As a result I never ventured far from the paved road, the penalty for which was a shorter scouting venture than I originally planned.

It was a simple matter, this failure to carry out my mission, of not having paid attention to a little-discussed concept in winter adaptations among animals - the concept of "foot-loading." One could see signs of the foot-loading principle in the woodland's snow carpet. Like my own tracks, the deer of the area were penetrating the snow to a few inches of depth, but some squirrel tracks on the snow just barely dented the surface. One cannot jump to the conclusion, however, that those results were simply because deer and humans are so much larger than squirrels.

Foot-loading is a measure of the distribution of weight on the feet of an animal. Most studies of this facet of anatomy have been done with mammals. The basic concept is relatively simple. The larger the foot of an animal per unit of body weight, the greater its ability to walk on snow. The total weight of the animal divided by the total area of its feet would give a foot-loading value in pounds per square inch. In turn, this has to be divided by four in order to get the load borne by each foot.

Foot loading is critical to animals that stay active in winter. The lower the "foot-loading" the greater the ability to walk on snow. In deer and closely related hoofed animals it is not just the area of the hoof that contributes to foot loading. The rest of the foot all the way to the dew claws adds to area to reduce the load factor.

Humans have a greater food-loading problem than most mammals because we use just two legs to walk. We compensate for this problem by manufacturing devices such as snow-shoes or cross-country skis. With snowshoes, we are copying natural anatomical features of northern latitude animals such as the snowshoe hare and its major predator, the lynx. A human that weighs about 155 pounds has a foot loading of about 2.13 pounds per square inch (2.13 lbs/sqin) in bare feet. On the other hand, a mature lynx has a foot loading of just under a half pound per square inch. That is because of the lynx's wide feet.

There is a concept in nature that says that in predator-prey relationships, the prey must always win the population game. While a lynx is a much more powerful animal, its population must never be able to wipe out the snowshoe hare population. This is prevented because nature has given the hare several advantages, such as a winter change of fur color to white and prolific reproductive rates.

So it is not surprising that another advantage of the hare over the lynx is found in foot loading. The hare's foot loading is a mere eighth of a pound per square inch, and thus it can run across the snow even better than the lynx. The hare, of course, must find shelter quickly, because the lynx may tire it out if the chase continues too long. The lynx succeeds at this some of the time, but hares escape often enough that their population survives.

I did some calculations in my own case. I carry a few more pounds than an "average" human, but I found that in my hunting boots my foot loading is just a fraction over 2 lbs/sqin. This is slightly lower than the bare-foot value given above. That's because even though I am heavier than average my boots have a large surface area. But,

if I were to have been on cross-country skis, that value would have been reduced to about 0.86 lbs/sqin. And, alas, those snowshoes I wish had been available would have taken the value to below a half pound - about equal to the foot load of a lynx.

That doesn't mean, of course, that I would have been as agile as a lynx on snow - and able to chase after snowshoe hare.

Natural Facts

While foot loading is calculated based on the number of feet, not all feet contact the snow at the same time. When walking in snow, a single human foot bears the bulk, if not all, of the load with each step.

Lynx have an advantage over other predators in snowy areas until human activities pack down snow giving predators like coyotes more access to snowshoe hares.

In areas where coyotes and lynx both hunt snowshoe hares in winter, coyotes tend to ambush and lynx tend to chase. This is because coyotes have a higher foot loading.

A visit with crows while muzzleloader hunting

Light snow had fallen just after New Year's Day a few years ago in the Delaware State Forest in northeastern Pennsylvania, creating a perfect time to enjoy the flintlock muzzleloader season for deer. On that crisp afternoon I had pulled the pickup well off a road and dismounted. After throwing my pack of "possibles" somewhat carelessly over the shoulder, I started into the woodland with the flintlock holding a charge of 2f black powder. The flashpan, however, was empty.

A cautious walk is demanded in such a snow-carpeted woodland, for one has to avoid stumbles generated by vines, snow-covered deadfalls, and other hazards in the rocky terrain. With measured steps, I paid little attention to anything in the distance. At one

point, however, I just happened to look up and noted a doe walking towards me. By chance a cluster of several trees was just to my left, and I stepped behind one of them to hide. It was an awkward situation, one for which I had not planned well. My backpack was not on with both straps, and it was necessary to slip it to the ground quietly. While pondering this situation, I risked peeking and noted the deer continuing her approach.

I use plastic disposable screw-cap test tubes – salvaged from my biology teaching days – to hold pre-measured loads of black powder. One containing 4f powder was fortunately in a pocket of my cammy-orange coveralls. I gambled a reach for the tube, screwed off the cap with thumb and index finger, pulled back the frizzen and placed some powder on the pan. When I again peered around the tree, flintlock now at the ready, the doe was standing broadside about 25 yards away. The shot was easy to place, and she traveled only about 30 yards, although out of sight over the lip of a low bench. Such luck with a flintlock is perhaps a once-in-a-lifetime experience, as was what would follow the next morning.

After delivering the deer to a local butcher shop, I returned to the cabin I used for such adventures only to discover a flashlight was missing from my gear. It had somehow escaped from the backpack, so I returned to the site the following morning after breakfast, again donned in orange for safety's sake. As I walked towards the location of the pile of entrails hidden over the lip of the bench, a lone crow cackled from overhead. I should have heeded the sentry, for at the edge of the bench I was greeted by the sudden eruption of a "murder of crows" – as such a flock is known – flailing into flight from the feast that I had so impolitely interrupted.

The action of crows on such debris in the forest – and along roadsides for that matter – is an excellent example of an ecological relationship classifying them as scavengers. However, a crow's beak is not suited to open a fresh carcass, and they must await other creatures – or motor vehicles – to give access to the flesh. I had done that chore for them. Crows, however, are also predators. The difference, of course, is that scavengers eat material that is

already dead while predators kill their food. In their predatory role, crows will, among other things, kill young songbirds in the nest. And crows are not just carnivores. They also feed on plant materials, thus classifying them as omnivores – consumers of both animal and plant foods. They are the ultimate in what ecologists call "opportunistic feeders."

Crows are held in low esteem by farmers. They are charged with damaging crops, especially corn. The tradition of using scarecrows in grain fields obviously results from that unwelcome activity. However, crows can be considered helpful in that they also eat insect pests such as cutworms, wireworms, and grasshoppers - acts that also earn them the title of insectivores. Some biologists argue that their value is greater than their nuisance.

After the cawing and flapping crowd of two dozen or so had exited the site, and were protesting loudly while perched in some not-too-distant trees, I strode down to the location of their brunch. It was amazing how little of the deer's internal organs remained, a lesson in the value of such scavenging by a variety of animals, not just crows. Without scavengers, it might be thought, the planet would be littered with the dead. The truth is that life would cease to exist without them and without the bacteria and molds that finish the job.

Incidentally, I never did find that flashlight, and I have to wonder if it was ever recovered by another hunter lucky enough to scavenge it from the forest.

Natural Facts

The term "a murder of crows" for such a flock apparently came about because such a group will sometimes kill a dying crow. The term actually dates back to the 15th century.

The scientific name for the American crow is *Corvus brachyrhynchos*. Corvus is the Latin name for raven, and brachyrhynchos means short beak.

Prior to the Middle Ages ravens were tolerated in England because of their role as scavengers, which helped to keep the cities clean.

The star constellation Corvus ("The Raven") involves a story from mythology where the god Apollo sends his pet raven for water. The bird returns late and lies about the delay. Apollo casts it from heaven.

The Crow Indian tribe got its name from a misinterpretation of their tribal name, the Apsaalooke. It was thought to mean "people of the crows," but it actually meant "children of the large-beaked bird." That bird was probably a now extinct relative of the magpie or blue jay.

A corvus was also the name for an ancient ramp-like device used by navies in the 3rd century B.C. that was attached to the bow of a ship as a boarding device against an enemy vessel.

A winter woodland prompts a hot topic

As boulders in a forest go, it probably would not attract much attention, that is, unless someone was scouting for a good deer stand that put them above the woodland floor. This outcropping, located in a Pennsylvania forest, projects from a sloping hill that drops from a regenerating clearcut downhill through a mature woodland to a hemlock-rimmed wetland one hundred or so yards away.

I have used it often, for the surface is table-top flat, and a modest size oak trunk grows tight against the downhill face of the boulder. It is a perfect leaning post on a convenient platform from which to observe the movement of bear or deer. From the uphill side you can walk right onto it, but the downhill side is about six feet above the rapidly sloping hill. Just ten yards farther out and the ground has sloped another 15 feet downward.

On this January morning the sporting arm was a flintlock long-gun, and the woodland was snow covered. Additional fine snow was falling straight down from an overcast sky generating the faint hiss of new powder settling on old crust. Having pushed the snow off the rock platform, I leaned against the natural oak post while protecting the powder in the flash pan.

It appeared that I had the woodland to myself. The parking spaces along the nearest road - which normally hold many vehicles during bear and deer seasons - were empty. I crossed no human footprints in the snow during my hike to this favored spot. Only the songbirds of winter kept me company and provided some gentle disturbance to the quiet of the winter woods. The survival of such small feathered critters, those locals that forsake a flight south for the winter, is a puzzle that ornithologists are slowly unraveling. Their adjustments to the cold season are many, one of which is increased feather growth. They also undergo changes in body function that makes them better able to withstand the cold.

Although I have not seen them at this location in the woods, back at a lakeside cabin from which my winter adventure originated, goldfinches feed all winter on the thistle seed offered in the porch feeders. In one series of research projects a few years ago, goldfinches were the subject of winter adaptation studies. Some of them that were caught in the summer were immediately subjected to temperatures as low as minus seventy-six degrees. They had to be rescued from those conditions within a matter of minutes. However, winter-conditioned goldfinches were actually able to survive the severe cold for several hours.

The whole phenomenon has to do with differences in enzymes, which are small protein molecules that drive almost all of the chemical reactions in animals and plants. Some enzymes work on carbohydrates to extract energy, while others act upon fats for the same purpose. In the winter, birds and other animals store more fat and produce more enzymes that utilize fat. Thus the goldfinches were able to burn fat much better in the winter condition. The result was better production of body heat.

We humans are mammals, of course, and not birds, but we have similar mechanisms in our body chemistry. Of course, the wise outdoorsman uses his brain first by dressing in appropriate clothing, and with today's modern fabrics hypothermia need not be a threat. However, when we do get cold the temperature-sensing part of our brain will bring about corrective action, the first of which is usually shivering. In addition, the adrenal glands will react by producing hormones that lead to the break down of stored fat and carbohydrate and thus cause what is called non-shivering heat production.

Being dressed properly on that snowy day freed me of concern about such topics. Perhaps the constant alertness for the presence of deer also kept the body heat going, for the hope was to get one within the limited range of the flintlock rifle. It was about an hour into the hunt when the first crunching noises emitted from the thicket uphill from me. The sounds were moving parallel to the edge of the clearcut, indicating that some creature was sneaking through the brush.

It was a deer, but its eventual appearance was over a hundred yards from my stand when it exited the thicket and walked downhill towards the wetland. It was certainly out of range for a safe shot in such timber, but never-the-less enjoyable to watch as the deer cautiously moved through the woodland. I suppose it was dealing with winter in its own way, and perhaps was carrying a fawn or two to deliver to the forest sometime in future warm weather.

Natural Facts

A good solution for a hypothermic human is hot tea and honey. The tea contains theophylline that helps stimulate heat production in cells, and the honey contains sugar.