



# **Why Big Fierce Animals Are Rare: An Ecologist's Perspective**

*Paul Colinvaux*

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## **Why Big Fierce Animals Are Rare: An Ecologist's Perspective** Paul Colinvaux

Here is one of the most provocative, wide-ranging, and delightful books ever written about our environment. Paul Colinvaux takes a penetrating look at the science of ecology, bringing to his subject both profound knowledge and an enthusiasm that will encourage a greater understanding of the environment and of the efforts of those who seek to preserve it.

## **Why Big Fierce Animals Are Rare: An Ecologist's Perspective Details**

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# From Reader Review Why Big Fierce Animals Are Rare: An Ecologist's Perspective for online ebook

## Sam says

While this is a surprisingly complete collection of essay style chapters that cover the 'big' questions in ecology it is a little simplistic and slightly dated (the latter is obviously not the author's fault but it is worth noting). Colinvaux does manage to explain the cornerstone ecological theories in a manner that can be understood by all through comparison with the 'human world' but this does mean that some of the key complexities of such theories are lost (without much indication that they exist at all). Granted this is a very difficult balance to get but it is important not to over simplify such theories as part of their importance and fascination is their complexity. The personal skew that Colinvaux also gives is a little off putting, particularly as a practising ecologist where I have to be sure to be as objective and scientific as possible in my work. The more personal approach that Colinvaux gives to each chapter results in the ecological theories coming across as pseudo-science rather than tried and tested science, which is something that us ecologists have fought against for some time (granted my own experiences are colouring my view slightly). This is partly due to the time of writing but even so it is something to be considered. Overall this is a good book for the non-ecologist and non-environmental reader but needs to be part of wider reading in these areas.

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## Stephen says

The title of this book, "Why Big Fierce Animals Are Rare," captures pretty well its essential character. Somewhat surprisingly the book is not *just* about big fierce animals, but a wide-ranging tour of ecology and ecological thinking. The **character** of the book, though, is straightforward, relentlessly clear-headed, and also a bit whimsical. Colinvaux is a talented writer, able to convey a subtly humorous tone while remaining focused on the facts of ecology.

Each chapter gives a good expectation of its contents, sometimes factually ("Why There Are So Many Species") and sometimes humorously ("The Curious Incident of the Lake In the Now Time"). The most surprising thing, to me, was the sheer volume of fuzzy, "intuitive" pop-ecology bubbles that Colinvaux popped along the way. For example, is "Nature red in tooth and claw"? Not really, as experiments show that species in outright competition cannot coexist in any equilibrium—one must inevitably dominate; yet we see stable equilibria of species everywhere. Why? Well, it turns out that natural selection, prizing survival-to-reproduce over all things, fits species to niches where there is no competition. Predators are opportunistic and mostly hunt the young, old, or sick; herbivores prefer different varieties of plants; and so on. So what competition we do see in nature is a muted form.

Colinvaux also busts some old (or not-so-old!) ecological theories, that are fashionable because they are "intuitive." For example, that "more-diverse ecosystems are more stable than less-diverse ones"... when put in other words—"complex ecosystems are more stable than simple ones"—it actually makes no sense. In other theories Colinvaux makes a good case for reductionism, that is, looking for lower-level explanations before appealing to grander, complicated theories. As it turns out, physical systems and Darwinian processes can explain quite a lot!

This is all very enlightening. Even Colinvaux's seeming dismissal of anthropogenic carbon emissions as a problem predicts the real problem: ocean acidification. (That is, reducing the seas' ability to absorb

atmospheric carbon!) Given that the book was published in 1979, one might have to do some follow-up with the primary literature (Colinvaux helpfully provides a bibliography and recommended reading at the end of the book) to verify the status of all the hypotheses presented, anyway.

The downfall of the book, minor enough that I don't change my overall score, is the last full chapter: "The People's Place." The hypothesis that "humans are special because we can alter our niche without turning into a different species" is very interesting, but Colinvaux falls into the same "population bomb" trap that was all the rage back then, predicting Malthusian collapse as we run out of resources and continue to grow the population (particularly among the poor unwashed of the developing world). As it turns out (see for example the work of Hans Rosling) humans are not stupid and will (on average) cap the number of children per woman at about 2, given a comfortable income, and therefore cap the population. Rosling, for example, predicts a steady population at about 10 billion. That's a lot, but it's not a runaway number.

Overall I highly recommend this book to anyone who wants to learn some science. Even though it's quite intellectual, Colinvaux has such an agreeable writing style that it's easy to learn from him. The "postlude" section in the back is actually a summary of the entire book in just a few pages, so read that first to get an idea of what's inside.

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### **Ryan says**

I found it frustrating going through this book as some of the ideas are unconventional and not entirely convincing, at least to a layperson. Having read basic ecology texts, the 'plain english' approach to conveying arguments was not that effective, I guess I would have liked to see more hard data and examples to back them. Quite a few chapters are great introductions to basic concepts like trophic levels, which I found more palatable. So overall this book is not too bad, just that the language and offhand informal writing style did not do it for me.

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### **Jonas Gehrlein says**

Colinvaux explains core ecological principles well to a more broad audience, while not focusing especially on the intersection of environmentalism and Ecology as is common for most books that are aimed at a general audience. Some of his criticism of Carlson though do not fit with her writings.

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### **John Hewlett says**

This book by famed ecologist Paul Colinvaux could have just as easily been called "Why Things Are the Way they Are" as only a small fraction of the book concerned the specific topic of "why big fierce animals are rare." These were Colinvaux's (occasionally politically incorrect) musings on how the world works, asking such questions as "why is the sea blue" and addressing psychological issues revolving around the human love of clear, cold, though nearly lifeless and unproductive streams. It addressed issues of community ecology and competition with heavy emphasis on the competitive exclusion principle. Though dated it was an interesting retrospective look at the state of ecology in the 1970's.

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## **Geordie says**

If you love Big Fierce Animals in theory but are secretly and occasionally anxiety-stricken that in the real world one or a bunch of them together are going to eventually eat you like a king-size Snickers bar as you lay in your sleeping bag (which brilliantly you got from Target and - nice one - actually has the huge Snickers logo on it to make it in fact look just like a Snickers bar already so you are pretty much boned and its totally your own kitschy fault) then this book is perfect for you cause no, he is not talking "rare" as with "well done" or "broiled with butter" it isn't about you eating them, goob, its about them eating you, but c'mon this is Colinvau, one of the most fantastic field biologists, nature essayists, logicians, and staunch evolutionists ever rolled into one, do you actually think the guy has a sense of humor too? - no flippin way, he means rare as in not many of them around and never has been. Please read this work, it is short and achingly beautiful in the same way that Dickey writes about the South and is ecology not from some asparagus-chewing pinbrain whose science knowledge is off the back of a cereal box but from an absolute gem of a true scientist-poet.

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## **Mihai Popa says**

I enjoyed a lot "Why big fierce animals are rare" as it is the best book in popularising Ecology I have ever found. It is deeply scientific, correct and profound, yet simple, funny and seducing to read. Ecological ideas are presented here in a series of examples discussed in depth, with all their connections and implications from an ecological point of view.

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## **Michael Eck says**

Right on, still provocative, still not politically correct, still pessimistic. My money on China to start a nuclear war against Africa.

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## **Bethanne says**

Good review of some of the biggest patterns in ecology, simplified for all readers. A bit out-dated. Writing was so simplistic as to be annoying sometimes.

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## **Harsh Thaker says**

A good start for beginners on the field of ecology. On how by natural selection species co exist both by competing and cooperating. Some good mental models on transfer of energy in the food chain, ocean life etc

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## John says

Clear-eyed, and full of appreciation. Reading reminded me of sitting on a porch with a great teacher, who is giving an impromptu seminar. I never did get my little bronze tags to flag the pages; I was constantly looking across the room, mentally reaching for them, but deciding I didn't want to put down the book.

"The sea is blue. This is a very odd thing because the sea is also wet and spread out under the sun. It ought to be green with plants as is the land, but it is not. There are murky coasts and estuaries, the green hard waters of stormy channels, the fog-covered silvery-gray of ocean banks. But the deep sea, the open sea, most of the sea, is blue. This strange blueness of the sea can tell us many things." You think of Robert Redford's raft bobbing in the blue under the sun; of Pi adrift who met no green until the mythic island with its teeth.

He talks of how it is that you find teeming life at banks and upwellings, the coasts at the mouths of rivers; and also talks, fondly, of dead poetic alpine lakes. "This beautiful, useless, oligotrophic lake." He explains why big fierce animals are rare, why there are no superpredators that feed on tigers, and (indirectly) why jungle leaves can be big sheets but temperate leaves are small. ("But suppose the tree made an umbrella that was half holes!") He tells of an arctic fox that once tried to take a sandwich from his pocket, as he sat on an arctic rock.

Sometimes it reminded me in its style of *The Unbearable Lightness of Being*. In Colinvaux, "An animal continually burns up its fuel supply to do the work of living, puffing the exhaust gases out of the smokestacks of its mouth and nostrils and sending the calories off to outer space as radiant heat." Compare Kundera: "Tereza forgot she was looking at the instrument panel of her body mechanisms; she thought she saw her soul shining through the features of her face. She forgot that the nose was merely the nozzle of a hose that took oxygen to the lungs; she saw it as the true expression of her nature." (And then a part I always like: "Her soul would rise to the surface of her body like a crew charging up from the bowels of a ship, spreading out over the deck, waving at the sky and singing in jubilation.")

And he talks of people. How ecology — breeding strategies, resources and population pressures — shapes the story of the rise of states, their fall, of wars of expansion, of caste systems, of repression. "With each stirring time of expansion we have gained beyond all reckoning in wisdom and the understanding of the life that is possible for us, and it has not all been lost with each subsequent collapse." An *Encyclopedia Galactica*. The chances of nuclear war, and which kind of nation will likely be the aggressor. He predicts that technology will continue to find the raw materials and energy for life; but that other resources, of privacy, of "some taste of adventure for the young," of "the right to do sometimes as one pleases," will be the resources that are eroded.

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## Bob Newman says

Everything you always needed to know about ecology\*

\*But didn't know that you wanted to ask.

Actually, when I purchased this book I thought it would be about the lives of tigers, leopards, jaguars and other big, fierce animals. I've read and enjoyed a few such zoological tomes over the course of a lifetime--- on seagulls, on penguins, or koalas---though my usual fare lies in literature, history, travel, and anthropology.

So, when I finally took Colinvaux's work off my shelf, I was rather surprised to find that it was about the whole circle of Life. I kept on reading though and now am glad I did. If you feel yourself lacking a scientific background, like your reviewer, and you have some basic curiosity about the field of ecology, this book is going to be just the ticket. The author has a genius for keeping it simple, keeping it clear. From the idea that every species has its niche, he expands to a host of other topics like the amazing inefficiency of plant life in converting available energy into growth (around 2%, compared to the efficiency of human-made engines, at least 20%); the grouping of trees in forests, the social life of plants; why the sea is blue (no life in it); the composition of soils in different parts of the world; how different sets of plant communities succeed one another as the environment changes; the peaceful coexistence of the vast majority of plants and animals instead of the vicious "law of the jungle" sometimes depicted in other literature. I'm just scratching the surface here. Many of the topics explored bear on the hot issues of the day, for instance global warming, pollution, and exploitation of earth's resources. Each topic is very understandable. If I were a high school or community college biology/ecology/botany teacher, I bet I could make a couple semesters' lectures out of this one book, it's that good. When the author tries to analyze human behavior and geopolitical rivalries on the basis of ecological principles in the last chapter, I think he falls between the cracks. Certainly human beings are animals only recently graduated from hunting and gathering. Their child-bearing habits must hark back to the Ice Age as Colinvaux says. But to try to predict human history on the basis of ecology alone is risky. The predictions made in the 1970s already look out of date. Other than this small criticism of one chapter, I heartily recommend this book. And it seems that the scary, ferocious Tyrannosaurus rex (largest predator that ever lived) is a myth. It was a lazy carrion-eater. Ah well, sorry, Rex, you looked great in Jurassic Park !

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## Cheryl says

The first part of my review is actually in my reading progress comments below - if you really want to know what I think, you have to read those. ;)

Now I'm done. Overall, I love the book, and would have read it several times if I'd owned it when it was new & I was a teen. Now, I just don't know how much is still relevant, and what the current understanding of how nature works is compared to what it was back 4 decades ago. I do know I'm not convinced by the author's argument, in the last chapter, about how human animals live and human societies grow.

But it's a fairly easy read, and the author's voice is engaging and relatively light. And he keeps saying things in fresh way, in a way that helps us think, in an idiom that sticks. For example, consider herbivores as hunters of plants. As far as the genes of the plants can cope, cows etc. are predators.

Also, it's a great read because the author admits that science is a process. It looks for deeper answers and is not satisfied with intuitive understandings or data that doesn't fit popular theories. As he puts it at one point, "Ecologists are still inclined to argue about these things, but it does look as if we might have the general answer to these questions, all the same." Research is still needed, for example by wildlife management research scientists like my middle son.

But there's a lot in here that makes wonderful sense, just as it is, too. Things that I'm sure Colinvaux and his sources have figured out, things that educators and policy-makers have yet to learn. For example, did you know that the ocean is mostly an infertile 'desert' and that we're already getting pretty much as much sustenance as we can from it?

And did you know that there's less competition than peaceful coexistence in nature? Fighting takes a lot of energy that is better used towards reproduction, after all. If you read only one chapter from this book, read the chapter titled "Peaceful Coexistence." Here's some of it:

"Animals and plants in nature are not... engaged in endless debilitating struggle, as a loose reading of Darwin might suggest. Nature is arranged so that competitive struggles are avoided..... A species lives triumphant in its own special niche....

Natural selection is harsh only to the deviant aggressor who seeks to poach on the niche of another."

Now the above is about inter-species interaction. Consider something even more potentially relevant to discussions of humans' warlike nature: wolves cull the young, old, and sick large herbivores, because if the pack took on a healthy adult, "some of the wolves would get hurt, and a hurt wolf can hunt no more. Natural selection see to it that the strain of brave aggressiveness in wolves is purged from the wolf gene pool because such individuals would incur more than an average share of being fatally hurt. and thus would leave fewer descendants."

Now, the problem with humans is that we create new niches. Colinviaux, in his concluding chapter, says we "Change our niches without changing our breeding strategy." To a certain extent, and from the perspective of 1977, he's right. Fortunately, we've seen evidence that empowering and educating women has led to them choosing smaller families. I am more optimistic than the author that this trend will continue, and that we will somehow develop strategies to share a healthy planet with whales, wolves, frogs, and plankton.

But who is far-sighted, who is looking at the big picture? Ecology doesn't even seem to be a thing anymore - can anyone tell me who is following in Colinviaux's footsteps? Can anyone tell me what has been learned since about the topics he studied?

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### **Blevin says**

my favorite kind of pop-science book. written by a real scientist, not a popularizer journalist. gives real insight into deep questions about the structure of the natural world, as well as the iterative process scientists have used over the years to try to understand it.

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### **Lisa says**

Very interesting material. Just written in a very complicated way, as if the guy had a word quota to reach. A bit of a shame.

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