The Effects of Human Society and Human Dynamics on Landscape Pattern

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There is no denying that our human societies have immense impacts on the natural environment. In exploring this issue I have seen that there are many aspects involved in how our society affects the landscape around us. Our housing developments, our transportation routes, our urban and suburban sprawl, and even our cultural and societal values all play major roles in how our landscape is constructed. In my article review I tried to get a broad sense of how human perceptions influence our societies, how our societies influence the landscape, and how our man-made landscapes influence the natural ones. I focused mainly on suburban and urban landscapes and the human infrastructure that is associated with these such as housing subdivisions, major roads and highways, and recreational parks.

In my analysis I included a number of social science articles in my review. These articles helped to explain some of the motivations behind human decision making. This is one of the great aspects of landscape ecology in that it is a comprehensive integrated field that looks to explore all facets that drive landscape pattern and change. To fully understand why our landscapes are the way they are and to try to plan for a better future we must try to understand the reasons behind them. Questions like; why we manage our land the way we do, and how our cities have developed over time will help us to explain and predict future landscape issues. For an even more integrated view I could have included articles that looked at the political, economic, or historical nature of how our human landscapes were formed and developed. My interest here, though, was to get a little insight into what inner motivations guide humans to use the land in the ways they do.

One of the most insightful articles I found on this topic was Jane Nassauer’s article “Messy Ecosystems, Orderly Frames”. In this article Nassauer tried to explain how our cultural perceptions of what the landscape should look like determines how we design and maintain it, and this landscape we create does not generally have a great ecosystem function associated with it. This concept is very interesting and I feel that it rings true. Coming from a suburban area, I have seen how people manage their properties and how the city manages its land, and the practices used are rarely done for the sake of environmental quality. The tradition of nicely maintained yards and landscaped parks and businesses serves little ecological function and is practiced mostly for aesthetical purposes. As for addressing this issue, typically there is a tendency of people to resist change, and these types of practices will probably continue unless we can slowly educate people as to how they can help to improve the ecology of the landscape and what benefits they might see in return from this. The issue with this is that sometimes the environmental, economic, and social benefits from redesigning our landscapes will be hard to measure and tough to see. Sometimes these benefits will not be felt for long periods of time and this can be a hard sell as people usually want to see results fast.

Along with this false perception of what the landscape should look like there is also an issue where; even when people value a certain type of landscape, it does not mean that it will flourish in our society. In Ariane L. Bedimo-Rung’s article “The Significance of Parks to Physical Activity and Public Health: A Conceptual Model” it was shown that parks have an enormous benefit to people and the
environment and people generally value urban and suburban parks for many reasons. However, even with large public support more land is developed for housing and urban development than for recreational parks. Also there is no real framework for developing or maintaining parks in cities or towns. In this case we can see that there are many other influences that go into how land is developed or not developed. In this type of land development politics and economics plays a huge role in how the land will be used and often these factors can outweigh environmental or social ones. It is nice that living in Rhode Island I have seen large public support for open spaces and I have had the chance to voice my opinion and vote on some of the issues on election ballots.

It is clear that the intersection between human developments and the natural world is a very complicated issue. One of the most interesting interactions that I read about is when wildlife adapts and thrives in our communities. As suburban sprawl encroaches into more rural settings, this interaction is magnified and soon conflicts can arise. People living in these areas typically value the natural setting and enjoy having the wilderness in their backyard, but often when the wildlife starts to impact them in some way, they instantly deem the wildlife as a pest and a nuisance. This is a typical human reaction to an inconvenience and again we can see how our human perceptions, wants, and desires impact how we interact with our environment. As quickly as a person appreciated the beauty of the nature in their backyard they are just as quick to turn on it. Changing these perceptions and adapting our lifestyles to a more eco-friendly landscape could be quite a challenge as it seems these human tendencies are implanted deep within our makeup.

Another major theme that I came across in the articles I read was the reactive nature of human societies to the environmental impacts that we see from our actions. I can see that as cities developed and populations rose there was little environmental consideration used in city planning. As I now review some of these papers and see some of the ways in which cities could have, and should, have been developed it is disappointing to see how are societies are built today. After reading “Comprehensive greenspace planning based on landscape ecology principles in compact Nanjing city, China” by C. Y. Jim & Sophia S. Chen I was very impressed in how our cities and towns might be adapted to include more green areas, but this article was only a conceptual framework and only time will tell if these types of measures are actually implemented into cities and to what extent. Adapting and reconstructing our cities to better serve ecological function is a very time consuming and costly effort and there are many other factors that play into these kinds of decisions like politics and economics. I fear that the “greening” of our cities and towns will happen very slowly if it happens at all, but any progress is better than none!

It seems as though the body of research about species and habitat diversity and richness in urban and suburban areas is growing and this is a good thing. As this field expands and more research is done, the hope is that it will be incorporated into city planning and development. One area of study that I would be interested in investigating is looking at small wooded lots in suburban areas that have not been developed and examining things like species richness, diversity, and connectivity of these areas. I often see these areas, usually less than half an acre, dotting the landscape when I am out for a run or a bike ride and I would be very interested to see what kind of value these areas have from an ecological viewpoint.
Through this literature review I have seen how complex the relationships between humans and the environment can be. I believe that further research into this field with more of a focus on how to adapt our landscapes to optimize our existing human infrastructure for better ecological function is a key to balance environmental quality with human values. Education will be a major factor in how we as a society can achieve these goals. Informing the public about landscape ecology issues in urban and suburban areas will only help to start changing the way our landscapes are designed. It seems that our human nature drives us to act in certain ways and often times this is not what is best for the planet as a whole. I am hopeful that the field of landscape ecology can be a catalyst in the movement to develop more ecologically friendly societies. There is no reset button in this world and some of the effects that we have had on the environment are not reconcilable, but if we can start to address and limit the negative impacts from some of our landscape design choices, we may see benefits to our health and the health of our ecosystems. Completely redesigning our societies is impractical and almost impossible, so the best way to improve the quality of our landscapes will be to adapt and modify our current situations to maximize ecological function along with human well being and necessities.
Annotated Bibliography


This article tries to show how parks can have a positive impact on people’s health and on society as a whole. As landscape ecology is an interdisciplinary field this article takes a social science stance and shows another side of the issue that should be included in the discussions of landscape ecology. Parks in the suburban or urban landscape can have many benefits to communities including environmental benefits, economic benefits, and physical, physiological, and social health benefits. There were some very interesting social concepts here such as the availability and distribution of parks across areas as well as their accessibility to different groups of people. An interesting fact in the article was that no national standard for an optimum area of park space in a city exists. As a major supporter of parks and open spaces I hope that more research can be done to show the benefits that green spaces can have on our society, and that policy makers and the public will appreciate and value these areas more in the future. Hopefully this can lead to the development of new parks in urban areas and the protection of open spaces and natural landscapes in rural settings.


This article explores the issues related to wildlife and the suburban environment. As the suburban landscape lies on the fringe between the urban and rural setting it is often a melting pot between human settlements and wilderness. Suburban development can have many different effects on the ecology of the region as certain habitats will be lost or fragmented and this will affect some species in a negative way and others in a positive way. Most conservation biologists agree that the net effect of suburban “sprawl” is a negative one though. This suburban effect on the ecosystem is very interesting as certain species are pushed out of the land they once inhabited, and others are able to adapt and thrive in our suburban setting such as coyotes, deer, opossums, raccoons, birds, squirrels, skunks, and beaver. Sometimes these species can grow to such extremes that they can become a nuisance to human life and are then considered a pest. Another issue is that suburban areas are highly prone to the introduction and spread of non-native plants which can take over ecosystems and push out native species that may have a high ecological function in the environment. This article gave a nice overview of the suburban environment and how the “sprawl” of housing developments and towns impacts the wilderness that once occupied that space. It is also very interesting to think about the species that are able to adapt so easily to our suburban environment and I often think of this as I watch squirrels run across telephone lines or seagulls scavenge for food at a McDonald’s parking lot.

This study looked at amphibian populations in Northern Italy to evaluate how the human-dominated landscape has effected species distribution and community structure. Amphibians were chosen for this study because they typically have low mobility, they are strongly related to specific habitat features such as wetlands, and they generally are not able to adapt to other habitats easily. With these qualities it seems that amphibians will be a good metric for landscape fragmentation and isolation by human developments and impacts. The study looks at the “wetland as a patch”, but also increased the scale to group wetlands together and include neighboring landscape features to get a better picture of what is driving ecological flows in the landscape. It is shown through some serious statistical analysis that environmental features like fish presence and anthropogenic factors like isolation effect amphibian richness and diversity. Two major forces in the amphibian ecology are extinction and colonization, where certain sensitive species will become extinct and other more resilient species will colonize and re-colonize landscapes lowering biodiversity and homogenizing the landscape. Some of the results of this study were sort of lost in the translation of the statistical methods. Also, I kept looking for more of a relationship and connection between human development and amphibian population. I felt that the article spent more time on how environmental factors like fish presence and sun exposure effect amphibian population than on how human fragmentation and isolation effect amphibians.


The “road-effect zone” refers to the area of significant ecological effects that extends outward from a road. In this study a four lane highway west of Boston, Massachusetts was studied and nine ecological factors were measured including; wetlands, streams, road salt, exotic plants, moose, deer, amphibians, forest birds, and grassland birds. The article, from the year 2000, states that the U.S. has 6.2 million-km of public roads and about 200 million vehicles using these roads. Traditionally transportation planning has only focused on the road bed itself and the narrow area that surrounds it, but as the science of landscape ecology evolves and ecological flows in the landscape are understood to be much broader, the issues that roads cause to these flows must be dealt with and mitigated if possible. Some of the adverse effects that the highway in the study had on the environment were blocked migration routes and morality to animals, road salt effects on plants, noise effects on bird communities, and elimination of suitable habitat for certain species. I had never actually thought of all the effects that roads and highways have on the environment and this article really brought this issue into perspective. There was a message towards the end of the article that a balance can be struck between environmental concerns and human transportation needs but that more research and planning needs to be done in this area. The article was quite thought provoking and the added maps and diagrams really enhanced my appreciation of the issues dealt with in the paper.

The goal of this article was to develop a general method for monitoring biodiversity in urban and suburban parks. The authors did a pilot study in West-Flanders, Belgium in a municipal park named Loppem. The method the authors produce is based upon habitat diversity and species diversity in the park. For habitat diversity they introduced the idea of punctual, linear, and planar elements where punctual elements are singular points like trees, pools, and icehouses and are measured in numbers, linear elements are alleys or corridors like hedges, riverbanks, and watercourses and are measured in length and planar elements are areas like woodlands, plantings, grasslands, gardens, ponds and buildings. For species diversity they looked at vascular plants, butterflies, amphibians, and breeding birds in the park and they did an inventory of the numbers of species found. The method the authors used is meant to be a “standardized and repeatable way by means of biodiversity indicators” and it may “be used as a basis for monitoring parks over time and it yields an inventory of taxa and habitats.” (160) The study seemed to be a good way to identify and inventory the habitat types and species within a park, but it seemed like it was only a starting point for other studies. In general the method seemed a bit obvious for inventorying a park and I kept waiting for some extraordinary result. Also this is one of the only studies I have seen where Excel 7.0 was cited in the calculations. (153)


Typically heterogeneity in resource availability is what drives spatial variation in plant diversity. Different plants are able to survive and thrive in different landscapes based upon resources and species characteristics. However this article explores plant diversity in the urban atmosphere where this historic, natural phenomenon is irrelevant. In the urban environment humans drive plant diversity, and in this article we see that wealth may be the factor that drives the human’s ability and choice in plant diversity. This relationship between wealth and plant diversity is referred to as the “luxury effect”. In this study, of the Central Arizona Phoenix Area, perennial plants were surveyed and species richness was measured against land use, elevation, median family income, historic land use, median age of housing stock, and human population density. There were a few relationships that became evident through this study and the major one was that as wealth increased plant diversity also increased. The article suggests that in urban areas plant diversity has less to do with traditional resource factors and more to do with human preference and financial availability. After reading this article I thought of the neighborhoods around my hometown and I could definitely see a pattern in plant diversity and neighborhood association, with wealthier neighborhoods having certain types of plants and landscapes and less wealthy ones tending to have different layouts and structures.

Conservation subdivision is a concept in which developers and land planners try to conserve wildlife habitat while still growing urban and suburban areas with housing units. The idea is to cluster homes together to maximize the open space and conserve habitat. This article reviews conservation subdivision as a concept and specifically reviews a book by Randall Arendt named, Conservation Design for Subdivision: A practical Guide to Creating Open Space Networks. As the American population is expected to reach nearly 420 million by the year 2050, there is a constant need for new housing developments. This causes drastic changes to the landscape as land is converted into housing developments, habitat is lost and fragmented, and ecological processes are disrupted. Conservation Subdivisions are seen as one way to minimize the effects of housing developments to wildlife and the environment. The article describes the three stages of development as design, construction, and post-construction and states that wildlife biologists and planners should work cooperatively throughout these stages to maximize the environmental and development benefits. The design phase seems to be the most important as proper planning can limit the negative impacts that the development can have on the ecology of the area. It is interesting, though, that even if the design for a subdivision is environmentally friendly many things in the construction phase can go wrong and can lead to negative impacts on the environment. This is generally because contractors and architects do not have the conservation training that may be necessary to fully understand the ecological implications of their actions. Along with this in the post-construction phase many homeowners do not fully understand the concepts of open space and are not aware of how to manage their property to maintain wildlife habitat or conserve ecological integrity. Also there is always the issue of conflicts between people and wildlife. Certain species soon become recognized as pests when they come into contact with the human developments. This can be seen as raccoons scavenge through garbage cans or groundhogs tear up a person’s garden. Overall this article found that conservation subdivisions can be a great tool for improving urban wildlife habitat and it provided some good recommendations for optimizing the effects of conservation subdivisions in the future such as new policies and education programs.


This article looked to create a comprehensive plan for greenspaces in Nanjing city in China. The plan includes green wedges, greenways, and green extensions to incorporate green areas into the urban city of Nanjing at three different scales; the metropolis scale, the city scale, and the neighborhood scale. One of the biggest themes that I took away from this article is that most cities around the world were not constructed from a master plan with a comprehensive framework to include greenspaces. Most cities such as Nanjing act in a reactive nature to things like population growth, industrialization, and economic influence. With these factors influence city growth environmental quality and functionality take a back seat and this can have immense consequences on species and habitat. Along with environmental quality greenspaces also have recreational, aesthetical, and spiritual value to humans and commonly urban sprawl leaves the landscape barren of these valuable green areas. The authors of this article offered some great planning ideas for Nanjing that could also be incorporated into other
cities across the globe. I was very impressed with their rational, intelligent design for greenspace planning and I can only hope that some of their plan is incorporated into Nanjing’s future and that city planners everywhere take the same type of approach in their plans. Also while reading this article I could not help but think of the current news in China of how smog and pollution are having terrible effects on the environment and on human life. This type of greenspace planning might be a great method for helping to control these issues in China, but it will be interesting to see if economic interests in China outweigh environmental interests.


This article tried to explore the intersection between human landscape perception and landscape ecology. Landscape perception is how humans view the landscape in terms of aesthetic value and importance. There is a theme of function versus appearance here as Nassauer writes that ecological quality tends to look messy and people typically want an orderly, neat appearance in their landscapes. People have an image of what nature ought to look like and most of the time this picturesque ideal of nature serves little in the way of ecological function. This idea of what nature looks like is also a very interesting concept, as nature has no specific form or frame, but if asked to imagine a natural scene one cannot help but picture a meadow or a lake or some other romanticized image inspired by a Walden or Thorough poem. Nassauer argues that landscape ecology is a design problem and a public landscape issue, where cultural expectations must be addressed and this “requires designing orderly frames for messy ecosystems”. She argues that creating these “orderly frames” for landscapes can bridge the gap between ecological function and human approval of landscape aesthetics. Introducing ecological function into common vernacular will bring ecological responsibility into our social and cultural values and will increase the ecological integrity of our landscapes. By changing people’s perceptions of what is good in the landscape we can start to change the landscape into something more ecologically valuable. This article was introduced some really interesting ideas about how humans effect the landscape and although it was not full of landscape metrics and statistics some of the writing and concepts were very difficult to understand.


This article was a great overview of urban ecology and is a perfect introduction into the science of urban landscape ecology. It seems that traditionally urban ecology has been neglected by scientists because it has been deemed as less worthy than non-urban landscapes, but this article shows that studying urban ecology is very important as most of the world’s population lives in urban environments and urban ecology can provide insight into ecosystem function and can be seen as a sort of field experiment about human impacts on ecosystems. This idea of the urban setting as an ongoing field experiment was very interesting. There is no way of actually testing the effects of cities on the environment in the laboratory, so we should evaluate the ecology of our urban landscapes to assess how our actions impact the environment and use this information to plan for the future. The article proposed a few steps that need to be taken to help move along the science of urban ecology and to help urban planners and managers. This included identifying what kind of nature actually exists in urban areas, learning about the processes
that affect urban nature, and then planning ecosystem-specific management schemes. It also called for an interdisciplinary approach to doing this as many social issues affect the natural landscape in urban settings.


In this study a social experiment was conducted in which people were shown a frightening movie and then were shown a video of either a natural or a built environment immediately after. The idea behind this experiment was to see if nature in general or natural scenes can have a something of a healing effect for people. The article shows that the majority of research has shown that people tend to prefer natural environments to built ones, and it dares to ask the question why? The proposed answer is that natural settings can have a restorative quality can relieve stress. I found the experiment itself to be very interesting as volunteers were asked to rate their moods beforehand, were shown a stressful frightening video, then were shown a video of a walk through a natural or built environment, were asked to rate the beauty of the environment they saw in the video, and then were asked to complete a concentration test. The researchers then did some statistical analyses of the findings using ANOVAS to calculate averages and yields from the tests. The major finding here was that the participants who viewed a natural environment after the stressful video reported more restorative qualities on their mood than did those who viewed the built environment. Also there was a slight relationship found in the concentration test as those who viewed the natural setting had a better performance than the others. The authors also gave a whole section about the limitations of their work and possible questions and concerns that exist. They ended the article by linking these restorative qualities of nature to land management and planning in our urban and suburban areas. I tend to agree with this paper in the fact that most people were prefer a more natural environment to a built one, but with this said I still see urban and suburban sprawl happening everywhere.