ENS 401

Literature Review Assignment

3/02/16

GVSU Grounds Naturalization

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Boreux, V. Kushalappa, C. Vaast, P. & Ghazoul, J. (2013, May 13) Interactive effects among ecosystem services and management practices on crop production: Pollination in coffee agroforestry systems. Proceeding of the National Academy of Science, 110:21 8387-8392 doi:10.1073/ pnas.1210590110

Pollinators are hugely influential in regards to the success of countless crops, even more so than irrigation and fertilization. Biodiversity in the flowering plants also increased the diversity of pollinator species. Asynchrony of flowering was found to be most important for a healthy population of pollinators. This article will be used to reference why pollinators and biodiversity in general is important.

Bormann FH, Balmori D, & Geballe GT (2001). Redesigning the American lawn: A search for environmental harmony. New Haven, CT: Yale University Press; 2001. Accessed February 11, 2016

This book is about lawns in America and how people take care of them. Our group will be referencing this to show what is used to take care of lawns and the drawbacks they entail, as well ways to improve the situation.

Bowles, M. L. & Whelan, C. J. (1996). Restoration of endangered species: Conceptual issues, planning and implementation. Cambridge University Press; 1996. Accessed February 11, 2016.

This book gives a method to restoring endangered species. It outlines the restoration of one of the possible flowers we would be using. Our group will be using it as a reference to provide guidance in creating a method to be followed by GVSU to restore endangered.

Fiedler, A. K., & Landris D. A. (2007). Attractiveness of Michigan Native Plants to Arthropod Natural Enemies and Herbivores. Environmental entomology. (36)4. p.751 - 765. Retrieved from https://ee.oxfordjournals.org/content/36/4/751

This study was done in an agricultural field on the Michigan State University Entomology Farm in Ingham County, MI. 43 species of native Michigan plants were tested against 5 exotic plants for their attractiveness to natural enemies. With two years of testing the native plants ended up attracting more natural enemies than exotic plants and in the article it lists the plants that were the best in the study.

France, R.L. (2007). *Handbook of regenerative landscape design.* CRC Press. Accessed February 11, 2016.

Regenerative landscaping is a method of designing landscapes to return natural capital to the local community. We will be referencing this book to explain the philosophy of landscaping in more than just an aesthetic way.

Foster, B. L. (1999). Establishment, competition and the distribution of native grasses among Michigan old-fields. Journal of Ecology, 87(3), 476.

This article is letting us know that if we look into certain native grasses we would have to place them in low productivity habitats. Some of these grasses are very competitive amongst their surroundings so we would have to be careful if we were to plant them.

Jacobs, J. (1961). The death and life of great American cities. New York, NY: Random House.

In her book, Jane Jacobs talks about how cities and parts of cities either thrive or fail. She describes in depth how to create the successful parts of a city, including parks and natural spaces. We can use the information she provides about what people find attractive about parks to help our own natural space be successful.

Jill, M.G., & Bloom, P.N. (2004). Choosing the right green-marketing strategy. *MIT Sloan management review,* 46(1), 79-84. Retrieved from: http://search.proquest.com.ezproxy.gvsu.edu/docview/224976311/5F1D2263074CC8PQ/1?accountid=39473

This article talks about how to choose a marketing strategy, specifically green-marketing. We can use techniques from this article to market the natural space at GV. In order to make our natural space successful, future and current students need to hear and be excited about it.

Klein, A. Vaissière, B. Cane, J. Steffan-Dewenter, I. Cunningham, S. Kremen, & C. Tscharntke, T. (2007). Importance of pollinators in changing landscapes for world crops. U.S National Library of Medicine/National Institutes of Health. doi:10.1098/rspb.2006.3721

This article states that fruit, vegetable, or seed production from 87 of the leading global food crops is dependent upon animal pollination. That translates into 35% of global crop production by volume. One of the main reasons for the current pollinator crisis is agricultural intensification, due to the reduced biodiversity of flowering plants that agriculture imposes. This article will be used to explain the how pollinators became threatened and why it is important to consider the consequences.

Koester, H.(2008). Native Plants and Urban Sustainability. Native Plants Journal 9(3), 323-333. Retrieved February 17, 2016, from Project MUSE database.

http://muse.jhu.edu/journals/native\_plants\_journal/v009/9.3.koester.html

This article is about how plants in can be useful for climatic adaptation, urban ecosystem restoration impacts, and an identification with a cultural sense of place. It also describes how adding trees or shrubs by parking lots increase the amount of evaporating surfaces. The article then goes on to state how to use many other types of plants and what they are good for such as absorbing carbon emissions from vehicles.

Lefebvre RC. Social marketing and social change: Strategies and tools for improving health, well-being, and the environment. John Wiley & Sons; 2013. Accessed February 11, 2016.

This book explains the basics of social marking. We will be using it to build a strategy to sell the idea that natural landscapes should be a value that GVSU has in the future.

Nicholls, C. Altieri, M. (2012). Plant biodiversity enhances bees and other insect pollinators in agroecosystems: A review. Agronomy, (33)2, 257-274. Retrieved from http://link.springer.com/article/10.1007/s13593-012-0092-y

This article suggests that farmers reduce the use (or at least be extremely cautious of the timing) of pesticides and restore “pollinator-friendly habitats.” This includes flower provisioning within or around crop fields. The methods of increasing local pollinators are specifically for farms, but we could also use some of the techniques for our project.

Parking lot rain garden landscaping protects our water. (2013, May 14). Marketwire Canada. Retrieved from http://go.galegroup.com/ps/i.do?id=GALE%7CA329698404&sid=summon&v=2.1&u=lom\_gvalleysu&it=r&p=ITOF&sw=w&asid=0591dbd0eab9dbc91bc547495d4cb46e

This article is talking about all the problems that come along with a parking lot such as oil, gas, antifreeze, and many others and how people should start to care about where all of those chemicals end up. Rain gardens are shallow depressions about 12 or more inches deep filled with compost that will collect and filter storm water and parking lot runoff so that the water is cleaned naturally. These rain gardens for the most part are self-sufficient with native plants so there is little maintenance that needs to take place cutting costs.

Rhoads, B.L., Wilson, D., Urban, M., & Herricks, E.E. (1999). Interaction between scientists and nonscientists in community-based watershed management: Emergence of the concept of stream naturalization. *Environmental Management 24*(3), 297-308. Retrieved from http://link.springer.com/article/10.1007/s002679900234#page-1

This article describes the relationship between scientists and non-scientists working together on a project to manage the watershed of a stream. While finding a solution to their problem, they also facilitated the concept of stream naturalization. Although we are not working with a stream, the team dynamic and concept of supporting naturalization will be very helpful.

Rich, D. (2014). Green parking. MassTransit.Com. Retrieved from http://search.proquest.com.ezproxy.gvsu.edu/docview/1508834564?accountid=39473

This article is talking about how “green parking” is becoming more of a common trend around urban places. This describes how using rain gardens, stone reservoirs, or pervious surfaces can reduce runoff and lower chemicals that tend to get into our water system.

Simmons, M., Bertelsen, M., Windhager, S., & Zafian, H. (2011). The performance of native and non-native turfgrass monocultures and native turfgrass polycultures: an ecological approach to sustainable lawns. *Ecological Engineering* 37(8),1095-1103. doi: 10.1016/j.ecoleng.2011.03.004. Retrieved from http://www.sciencedirect.com/science/article/pii/S0925857411001005.

This is a study comparing natural style grasses vs a groomed monoculture style lawn. We will be referencing this study when covering the amount of work that goes into maintaining grass, as well as the performance of natural grasses.

Solaiman, Z.M., & Mickan, B. Use of mycorrhiza in sustainable agriculture and land restoration. In Mycorrhizal Fungi*: Use in Sustainable Agriculture and Land Restoration.*1-15. Retrieved from http://link.springer.com.ezproxy.gvsu.edu/chapter/10.1007/978-3-662-45370-4\_1.

This is a technical article about the impact of underground fungi. Our group will use this information to explain some of the difficulties of changing to natural landscaping, and how traditional landscaping methods can hurt attempts to restore land to natural states.

United States Patent Office. (2005). Multi-flora, low-maintenance landscaping US Application Number US 10/827,226. Retrieved from https://www.google.com/patents/US20050229827

This reference is a patent for a specific type of low maintenance, multi-flora landscape. We can use similar techniques and plants in our natural space at Grand Valley. The methods are for year round or nearly year round landscapes, which is perfect for what we are planning to do.

Volder, A., Watson, T., & Viswanathan, B. (2009). Potential use of pervious concrete for maintaining existing mature trees during and after urban development. *Urban Forestry & Urban Greening, 8(*4), 249-256. doi:10.1016/j.ufug.2009.08.006 Retrieved from http://www.sciencedirect.com/science/article/pii/S1618866709000557

This article is stating that increasing the amount of pervious pavement would have greater soil water content than soil that is regularly deeper. Thinking about sustainable Earth friendly ways to create a parking lot could be very beneficial to nearby plants and the environment surrounding it. Urban trees reduces storm water runoff, reduces air temperatures, and can remove pollutants.

Williams, N. M., Ward, K. L., Pope, N., Isaacs, R., Wilson, J., May, E. A., & Peters, J. (2015). Native wildflower plantings support wild bee abundance and diversity in agricultural landscapes across the United States. *Ecological Applications, 25*(8), 2119-2131.

This article lets us know why bees are important for pollination and what different types of wildflowers are out in the environment. This could help us decide which ones are prettier and come back each year. This article also, describes what wildflowers attract what kinds of bees, from honey bees to wild bees.

Yang, H., Mu, S., & Li, J. (2014). Effects of ecological restoration projects on land use and land cover change and its influences on territorial NPP in Xinjiang, China. CATENA 115, 85-95.. doi: 10.1016/j.catena.2013.11.020. Retrieved from http://www.sciencedirect.com/science/article/pii/S0341816213002981

This study details the results from restoration projects in China. This information will be used to discuss the results of these types of projects.