

# PLASTIC BAGS: HAZARDS AND MITIGATION

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## **Research Proposal**

The pollution created from plastic bags is a growing problem and can be seen in many different forms. The first part of our project will focus on the various areas affected by the growing use and waste of plastic bags: oceans, streams, landfills, air and natural resources. In developed societies, plastic bags are discarded in landfills where they take up a significant portion of landfill space. Not only is space an issue, but it takes hundreds of years for plastic bags to completely decompose. Meanwhile, the decaying particles have negative effect on the soil and water surrounding landfills. Unfortunately, plastic bags are not confined to landfills. In this project we will explore the amount of pollution plastic bags create in streets and in oceans. Analyzing the growing marine debris centers, such as “trash islands,” can help to understand plastic bags’ role in ocean pollution.

Aside from the physical pollution and the littering of streets and oceans, this project will explore the more subtle and less obvious effects that production and disposal of plastic bags have on the environment. We will examine pollution associated with the bag manufacturing processes and those associated with recycling. Finally, analysis of the detrimental effects that plastic bags have on animals and their habitats will finalize the portion of our project that focuses on pollution.

Plastic bags find their origin in a variety of places. Non-grocery retail stores and restaurants are significant contributors, but there is no greater impact than the plastic bag waste that is generated by grocery stores. Nowhere else do people walk out carrying 10 plus plastic bags multiple times in one month. This phenomenon had been overlooked until the last decade when cities around the world slowly started recognizing the patterns and regulating the then unlimited usage and overconsumption of plastic bags by businesses and shoppers. Cities and

countries in Europe were first to introduce regulatory legislation of plastic bags usage. Though European cities and countries are still working towards a complete plastic bag free society, we will examine these areas and research what worked and did not work in the process of eliminating plastic bags. We will also assess the positive and any negative consequences of these bans.

Most recently many cities and counties in California have considered and introduced the plastic bag ban, one of which is San Luis Obispo County. In addition to the research-based portion of our project, we plan on actively participating in the community to contribute awareness about this issue. San Luis Obispo County recently passed an ordinance that, beginning in October, 2012, will restrict the distribution of plastic bags in many stores. We plan on using the information gained through the research portion of our project to spread awareness, within and beyond the Central Coast, of the hazards created by plastic bags and what communities can do to help.

Being Cal Poly students, we have many resources available for acquiring information. The Cal Poly Library and community, as well as the larger San Luis Obispo area, will prove valuable. We hope to further inform the student body about current events and information concerning the topic. In addition, we would like to further spread awareness and provide an additional venue for purchasing reusable bags containing information on the issue. We are lucky enough to have multiple on-campus grocery stores (Campus Market, Village Market) where we hope to inform and encourage those businesses to lead by example and publicly adopt the ban on plastic bags and endeavor to implement it as soon as possible.

We anticipate coming into closer contact with the local grocery stores in the surrounding areas (Albertsons, Trader Joe's) in order to encourage those businesses to also spread awareness.

Our future prospects with the local grocers include an information center outside of the grocery stores where we could distribute information, promote awareness, and obtain public attitudes towards the matter. We value knowing the status and opinion of customers in order to determine what measures should be taken in order to better inform and involve the community throughout this process.

We understand that part of the reason why many people are against the ban on plastic bags is that they believe it is infringing on their rights, creating an inconvenience, and adding an additional expense to their shopping. Those opposed also see this as an unnecessary meddling through governmental involvement. In addition, there is also a concern about the sanitation of reusable bags. Through the public awareness portion of our project we seek to eliminate or reduce the opposing arguments by providing information about impending dangers and hazards that plastic bags create. We seek to persuade and inform the community that the detrimental effects associated with unlimited reliance on plastic bags outweigh any future inconveniences.

## Annotated Bibliography

Barnes, Catherine. "City Operations and Neighborhood Services." *Plastic Bag Reduction Ordinance, San Francisco*: file number 070085. 27 March 2007. Web. 7 February 2012.

This official city ordinance of San Francisco was one of the first in California to implement the ban on plastic bags. The ordinance is divided up into sections addressing certain aspects of the legislation. The first section discusses the findings regarding consumption of plastic bags and the impact on the environment of San Francisco. The ban of the bags claims to promote conservation of resources and energy. In fact, they state that it is better than recycling, would take up less space in landfills, and the re-usable bags tend to be eco-friendly as well. The ordinance discusses the legislative initiatives to bringing a re-usable bag through the implementation of rebates. If stores fail to comply with this new ordinance, penalties such as fines will be in accordance. The entire ordinance seeks to enhance the general welfare of the city by this mitigation technique, which is one step closer to a sustainable society.

Boote, Werner, narr. *Plastic Planet*. Brainstorm Entertainment, 2009. Film.

In this documentary, the writer and narrator Werner Boote, travels the world to prove his thesis of a "plastic planet". He explores various manufacturing planets, where they will actually let him in, and researches the harmful process to the environment that plastic manufacturing creates. He touches on how plastic is in almost everything we have. The Earth's capacity to hold all of these plastic materials is finite and limited. The documentary takes an overview of plastic materials in general and gives a visual and compelling argument that our world cannot continue this way of life.

Brown, David T, et al. *Plastic Waste Management*. New York: Marcel Dekker, Inc. 1993. Print.

The *Plastic Waste Management* text addresses the issues of plastic waste in accordance with other forms of waste. The book looks into various approaches to the plastic waste issue to understand the waste problem in general. Current changes in demographics, regulations for disposal, technical overviews, plastic consumption, and various aspects and ways of current recycling projects are all topics covered in the text. The main aspect that relates to our project involves the aging of plastic bags and the inability for most to fully biodegrade in landfills. Various studies, facts, and charts give the components and implications plastic bags and plastic have in general.

COG Staff, Department of Environmental Programs. *Plastic Bag Report*. Metropolitan Washington Council of Governments, 14 Oct. 2009. Print.

This document discusses the environmental situation of the local Washington area being affected by pollution and then also goes on to examine pollution in the United States' as well. There is also mention of European countries and their involvement with the issue of plastic bag waste, but mainly focuses on what America is doing with bans against plastic bags. There are charts and tables giving information on what various supermarkets and retail stores do with their plastic bags: if they issue them or not, and if they suggest that customers bring and/or purchase their own reusable plastic bags for some type of reward or incentive. It also discusses the different legal approaches, enforcements, and bans that states across America have tried to implement and highlights those of which have seemed to be more successful than others. Such an analysis is imperative to creating a system in a county or state that will be effective. Ordinances must be created with consideration of what the people and customers did not like in the past in hopes of creating a better adaptive system that people will adhere to and be willing to participate in.

Cuddy, Bob. "Plastic Bags Banned In San Luis Obispo County." *The Tribune*, 12 Jan. 2012. Print.

This is a report on the outcome of the highly anticipated hearing in San Luis Obispo County regarding the big debate on the ban of plastic bags. On January 12, the Waste Management Board voted to put the ban into place, eliminating the distribution of plastic bags in most convenience stores, supermarkets, pharmacies, warehouse stores, and most others. The ordinance will allow the distribution of paper bags with a ten cent fee per bag. There are many people lobbying against this movement, but for the moment the ordinance is still set to come into effect in October of 2012.

Fisher, Tom and Shipton, Janet. *Redesigning For Re-Use: The Life of Consumer Packaging*. London: Earthscan, 2010. Print.

This book explores the ways in which people can and should re-use the things that we typically consider "waste." There are specific examples from the United Kingdom that has had success in encouraging its citizens and companies, especially in the packaging industry, to reduce the ghastly amount of waste and the tremendous impacts that non-decomposable waste can have in such large quantities. It is suggested that while the amount of waste that society creates on a daily basis is a habit that must be addressed, it is relatively unlikely that we will stop wasting at the rate that we do unless there is a good enough reason not to. Waste has become a part of today's culture. Companies need to focus on creating a product that will last and is functional and intended for more than one use. The text refers mainly to packaging in general and its history, function, and role. It also includes information on the plastic carrier bag and its recent changes and developments and where some countries have placed a ban on them, regulating their distribution and usage.



Gordon, Miriam, et al. "A Plan of Action from the Plastic Debris Project". *The California Coastal Commission*, June 2006. 2 May 2012. Print.

This document by the California Coastal Commission addressed the problems, sources, effects, and a plan to address all of the problems surrounding marine debris, especially plastic. The report contained four parts. First addressing marine debris sources, next the impacts, thirdly the efforts to mitigate, and finally action plans to reduce the overall waste. In relation to plastic and plastic bags, a heavy portion of the plan focused on the problems of plastic in the oceans and what can be done to reduce them. Data surrounding the exact contents of plastic pollution on the beaches and the amount in the oceans were highlighted. Plastic bag pollution and the harmful effects that they have on marine life was addressed. Overall the article pointed out and backed up that plastic pollution in the oceans is most prevalent and most harmful to the ecosystems of the oceans.

Gore, Al, et al. *Pollution*. California: Greenhaven Press, 1994. Print.

This book is composed of chapters written by various authors and their views upon the topic of pollution. They address several aspects of pollution including air, water, and land and analyze the role that corporations play in polluting the environment. The Environmental Protection Agency (EPA) is also assessed and critiqued on its overall effectiveness in addressing toxic pollution. The most relevant portion of this book covers recycling and the controversial topic of how involved the government should be in implementing mandatory recycling laws and exploring the cost and who does or does not benefit. One author also brings attention to the point that while recycling is a good idea, it still doesn't get rid of the waste that we are exponentially producing so a larger and more serious emphasis should be put on reusing products. This corresponds to our project's emphasis on banning total distribution of plastic bags in venues such as grocery stores to halt one of the large and growing sectors of waste polluting our environment.

Joseph, Stephen. "Save the Plastic Bag." *Save The Plastic Bag Coalition*, 2008. Web. 8 Feb. 2012.

This is one of the foremost organizations created to stand against the ban of the plastic bag. This particular coalition is involved locally in the San Luis Obispo area and is located out of San Francisco. This is a very thorough website that provides organized information expressing that plastic bags are a not as harmful and detrimental problem that people think they are. While we do not agree with this standpoint, it is important to review their information and main points, and look into where they are getting this information in order to provide strong counter arguments against the coalition and what they stand for. Also, being that we have hopes of decreasing the local San Luis Obispo area's consumption and waste of plastic bags, it is important to know how a portion of the target population feels about the situation and ultimately look for ways in which a possible compromise or middle ground can be reached.

Lazarus, David, et al. *Garbage and Recycling*. Michigan: Greenhaven Press, 2009. Print.

This book addresses garbage in general and first attempts to answer the question: is garbage a serious problem in our world today? The authors then go on to discuss and argue for and against the effectiveness and imperative demand for recycling. Then they address how and how much the government should be involved with the garbage and recycling issues today. This is very relative to current debates concerning the ban on plastic bags primarily in grocery stores. The book does not take one particular stance on the issue but rather provides different and opposing ideas from various authors and organizational stances like that of Greenpeace. There is discussion about the extent of harm to marine wildlife, providing specific instances of entanglement by various plastic materials. It also touches on the debate surrounding plastic bags providing arguments strongly for and against the need to draw so much public and government attention to them.

“List of Plastic Bag Laws.” *Campaign for Recycling*, 2012. Web. 7 February 2012.

The organization for the Campaign for Recycling is dedicated to protecting the environment by preventing pollution through recycling policies. The organization believes that through producer and consumer interaction, compromise, and through waste management and recycling goals, the nation can lessen the dependence on disposable materials. The section that highlighted plastic bags refers directly to the current legislation limiting, or in cases charging, for plastic bags in grocery stores. Twenty-one of the counties listed were in California, including San Luis Obispo. The Integrated Management Authority of SLO supported a plastic bag ban with a ten cent minimum charge required on all other distributed bags. The ban will be effective in San Luis Obispo on October 1st 2012.

Marrow, Anthony J, et al. *Rush to Burn: Solving America's Garbage Crisis*. New York: Newsday Inc., 1989. Print.

The book, *Rush to Burn: Solving America's Garbage Crisis*, consolidates a number of works from various authors concerning the massive amounts of waste that people of the world produce, the issues created, and the potential solutions to these growing problems. It focuses on the disposable society as a habit and lifestyle among many. The implications waste has on our environment include running out of space in our landfills, the transportation costs, and the environmental problems. Concerns and problems associated with plastic and plastic bags occur throughout the United States. The book's final section focuses on potential solutions that have been looked into to reduce the amount of waste, bans being one of the successful options. The authors call for an increase in public education on the implications of disposables to counter act the lack of political will to implement these regulations.

“Nasty Plastic Facts.” *Love Your Earth*, 2012. Web. 4 April 2012.

This website and organization is dedicated to the elimination of plastic bags by replacing them with canvas, organic, earth-friendly bags. The organization supports the need to reduce the usage of plastic bags by listing reader-friendly, straight forward facts on the hazards of the plastic bag. Facts concerning the threat to wildlife, lack of recycling, the lifespan, and production costs to the environment were addressed.

Palmer, Joy. *Waste Control: Recycling Plastic*. New York: Franklin Watts, 1990. Print.

This text explores different types of plastic forms that get recycled and more broadly defines the problems that plastics bring about by their inability to decompose. The typical bags distributed in grocery stores are long-lasting plastic (like all examples of plastic), but are only put to short-lived use. This represents an extremely inefficient and unfair exchange of resources. Plastic’s durability should be embraced rather than misused, and products (because our society would have a hard time eliminating the plastic products completely) should be manufactured well so that they are sturdy enough in form to be able to be used by people multiple times. For example, plastic bags should be designed with sturdier carrying handles so that people can get in the habit and mindset of using them more than once and rid everyone of the notion that they will break after, if not during, a single use.

Pedersen, Anne. *Environmental Book*. New Mexico: John Muir Production. 1991. Print.

The *Environmental Book*, describes the various aspects of the ecosystems of the planet and the main hazards that threaten them. It summarizes how each system naturally functions and shows how the unnatural, man-made aspects of our world disrupt the environment. The book not only talks about how the disruption makes an impact on the environment, but also the amount of waste the population disposes of in addition to the contents of our landfills. The mention of plastic is predominant. The impact of plastic bags upon the environment, especially marine life, is addressed. The facts surrounding the production, manufacturing, and disposal of plastic bags, and plastic in general, are addressed. The inability to biodegrade, the ingredients of the supposedly “degradable” plastics, and their effect on the environment as well as human health are discussed.

“Planet’s Earth’s New Nemesis?” *BBC News*, 2002. Web. 7 February 2012.

The article from the BBC discusses the trend of banning plastic bags that is occurring, and is set to occur, in different places around the world. They first discuss the phenomenon of the switch to a heavy dependence on plastic bags and why it has been occurring. The manufacturing of plastic bags is cheaper and requires a great deal less energy when compared to paper bags. This over-reliance on plastic bags in many grocery stores has contributed to a worldwide problem of pollution. The article cites places such as Taiwan, South Africa, India, and Bangladesh that have all been environmentally damaged due to the pollution caused by plastic bags. Statistics of the

total amount of bags used by countries show the importance of this switch to re-usable bags. After Britain made the switch, studies have shown that their consumption of plastic bags decreased dramatically.

“Plastic Bag Litter Pollution.” *Californians Against Waste*, 2012. Web. 18 April 2012.

The Californians Against Waste association is a non-profit environmental research and advocacy agency which focuses on pollution and conservation problems in California which threaten public health and environment. Their accomplishments include many things from the Recycled Newsprint Act of 1989 to the helping of passing local ordinances banning plastic bags. The overall website highlights numerous environmental issues and ways to take action. In reference to plastic bags and the plastic bag ban, the organization highlights current local bag ban ordinances, bag ban tool kits, latest plastic bag news, ocean protection, and plastic litter in general.

Ramroop, Tara, et al. “Great Pacific Garbage Patch: Pacific Trash Vortex.” *National Geographic; Education*, 2012. Web. 25 April 2012.

This article published in National Geographic discussed the garbage patches that exist around the world in the oceans. The article details the whereabouts of each of the five garbage patches and the natural forces that control the collection of debris. Plastic is highlighted as the main debris comprising these patches. The article discusses the teleconnectivity that these garbage patches have on all forms of marine life. Not only does this pollution harm specific species that mistake the plastic for prey but also the effects that this has on the entire food web and marine community.

San Luis Obispo County Integrated Waste Management Authority. *An Ordinance Establishing a Waste Reduction and Reuse Program for Carryout Bags*. 15 Sept. 2011. Print.

This ordinance clearly explains its purpose and reason for such action. Terms are defined to explain the clear process of a ban on plastic bags in San Luis Obispo County; these include the definition of single-use carryout bag, reusable bag, product bag, and what a “recyclable paper bag” consists of. Stores’ various responsibilities in adhering to the ordinance are also explained. The ordinance suggests a complete ban of any type of plastic, single-use bag but the allowance of purchasing recyclable paper bags for no less than ten cents. Stores may also emphasize and offer the reuse of their cardboard packaging boxes to aid in transportation and carrying of customers’ purchased goods (for free or for a fee: a decision left up to the companies). Also discussed, are the specifics of enforcement and penalty for violation of the ordinance. The ordinance would come into effect on September 1, 2012. This is the official ordinance that passed in January of 2012 but was amended to be placed into effect on October 1, 2012.

Spivey, Angela. "Plastic Bags—Prolific Problem." *Environmental Health Perspectives* 111.4 (2003): A208. Academic Search Elite. Web. 7 May 2012

This journal article focuses on the growing problem of plastic bags not only in the United States but in other parts of the world. It focuses on how the Environmental Protection Agency doesn't see plastic bags as being a big problem to the environment but instead focuses on the cost and hazards that the bags have. Plastic bags are a common type of debris found in the United States. The article also touched on the harm that plastic bags cause to marine life. Also the article discusses that although the overall harm of plastic bags in general does not compare to other hazards in the world, the way the world and the United States handles the disposal and mitigation of them could be improved.

Tertini, Judy. *Earth at Risk*. Washington: The Wright Group. 1994. Print.

The book, *Earth at Risk*, provides an educational and visual consolidation of the state of our fragile earth. The text highlights various hazards that ecosystems of the earth face. Pollutions such as marine, air, and water are major topics addressed. The importance of maintaining the natural flow of the environment is stressed, while reducing the negative man-made issues. The text stresses that natural disasters, however devastating, are a part of this world and are not comparable to the dangers of man-made or influenced disasters. The aspect of this book that touches upon plastic bag hazards includes the overwhelming presence in our oceans and its effect on wildlife. Plastic is the most dangerous form of pollution for marine animals. The book provides statistics surrounding how plastic bags harm the species of our oceans. Suggestions to the reader to lessen their own personal environmental impact include taking personal cloth or reusable bags to the grocery store.

"Tracking Plastic in the Oceans." *Earth; The Science Behind the Headlines*. American Geosciences Institute, Feb 2012. Web. 7 February 2012.

The article in *Earth* focuses on the pollution of plastic in the oceans and the hazards that marine life face. Plastics and garbage make their way into the oceans through ships, rivers, and off shore pollution. This debris travels through the natural currents into giant whirlpools that move the floating plastic debris to the center. This creates great garbage patches in our oceans. There are at least five known garbage patches in our quite large. The biggest of the garbage patches is the Great Pacific Garbage Patch which is estimated to cover between 700,000 and 15 million square kilometers. The article pointed out that most of the plastic debris stays there but a significant portion gets broken up into smaller pieces and makes its way in to the ocean where fish mistake it for plankton and turtles mistake bags for jellyfish. The environmental hazards and future implications of these "garbage islands" are unknown.

Yardley, William. "Seattle Bans Plastic Bags, and Sets a Charge for Paper." *New York Times*, 20 Dec. 2011. Print.

This article reports Seattle's history of dealing with the plastic grocery bag, explaining that, in 2008, they were the first city in the nation to approve a fee for paper and plastic bags in retail stores. Initially the charge was twenty cents per bag, but with such a poor economy at the time the voters eventually rejected the fee. However, this ban and charge was diffusing all over the nation and other cities moved forward with similar bans. The article highlights certain large grocery and retail stores' support for the new measures being taken. It also raises the issue that with a ban on plastic, shoppers are geared more towards thinking that paper bags are the more sustainable way to go, and while there are pros and cons to each, neither is completely sustainable.

## Project Outline

- I. Introduction
- II. The role of plastic bags in developed societies
  - a. The history of the plastic bag
  - b. Prevalence of usage
  - c. Where you find them: Establishments: grocery stores, pharmacies, retail stores, restaurants, etc.
  - d. Purposes of use
  - e. How they are disposed of (in the general sense)
  - f. Anecdote of the lifespan of a plastic bag
  - g. Today's wasteful society
    - i. Waste culture
    - ii. People set in their ways
- III. Where does trash go?
  - a. Dumped into the oceans
  - b. "Garbage Islands"
  - c. Other aquatic systems: rivers, drains, and streams
  - d. Landfills
- IV. Plastic pollution
  - a. Oceans
    - i. Effect on marine life
    - ii. Floating trash island
      - 1. Ex. Great Pacific Garbage Patch
  - b. Land
    - i. Landfills
    - ii. Trash disposal and storage
  - c. Air: air pollution (burning)
    - i. Plastic production factories
    - ii. Use of natural resources
- V. The argument for the mitigation of plastic bags
  - a. Reducing the amount of plastic bag waste is a step in the right direction towards controlling the vast amounts of waste created by humans and ultimately minimizing negative impacts on the Earth.
    - i. Where we do and do not need to cut down the usage of plastic bags
      - 1. Focus of grocery stores' gross consumption of bags.
        - a. Statistics on usage and distribution.
        - b. Primary chain grocery stores
        - c. An achievable environment for change
      - 1. Alternatives to plastic bags

- a. The Costco approach: No distribution of plastic bags, instead offer recycled boxes and packaging.
  - 2. Usage and distribution by other establishments
    - a. Restaurants, retail, pharmacy, etc.
- VI. The ban on plastic bags
  - a. History of ban implementation
    - i. How it has worked or not worked in various cities and locations around the world.
    - ii. Successful implementation methods
  - b. California
  - c. Focus on the new ordinance in San Luis Obispo County
- VII. The counter-argument to the ban on plastic bags
  - a. Their arguments for keeping the plastic bag
- VIII. Field work
  - a. Grocery stores
    - i. Verbal and written surveys
    - ii. Informing the public of the ordinance
    - iii. Distributing information/pamphlets
  - b. Surveying the attitudes of the local San Luis Obispo and Cal Poly populations
    - i. Survey and/or public awareness
  - c. Campus grocery stores
- IX. Analyzing the response of the public
- X. Finding and creating a successful campaign for the mitigation of plastic bags
- XI. Alternatives
  - a. Reusable bags
    - i. Pros and cons
  - b. Paper vs. plastic
  - c. Recycling
- XII. Conclusion
  - a. Stress the importance of mitigation
  - b. Recap findings and counter the counter-argument
  - c. Propose a successful mitigation plan
  - d. Future endeavors and opportunities for change



## **Plastic Bags: Hazards and Mitigation**

### Introduction

The population of planet Earth is over seven billion people. With this rapidly growing population comes a massive amount of waste that the Earth is not capable of handling. While more techniques and improvements to the recycling process arise, so do more people and more waste. There are many benefits and effective ways of recycling, but recycling always seems to be losing the environmental race. The current state of the environment calls for a new, drastic approach to aid recycling, and other waste management processes towards the ultimate goal of maintaining a healthy and livable environment, not only for this generation, but for generations to come.

Recycling has been a positive movement; however, its efficiency is questionable. Despite the efforts of recycling, the rate of the production of items is rising much faster than recycling rates. The problem lies, not within the idea of recycling itself, but rather the habitual wasteful nature of developed societies and the rapid rate by which goods are demanded. Unconsciously or not, wastefulness has become a part of everyday life. Through the overwhelming number of phonebooks, junk mail, supplementary wrappers, encasements, and layers of packaging on countless items, most of which are not at the request of the recipient, an exhaustible amount of waste is created for an unjustifiable purpose.

Perhaps the most prevalent and obvious example of this unavoidable waste begins with a trip to the grocery store. While the packaging on the meats and the loaves of bread serve a legitimate hygienic purpose, the short-lived life of the plastic bag carrying out those items do not. There are alternatives that can successfully serve the same function as a plastic bag without contributing to the ultimate wasteful and hazardous effect that they have.

Hazards caused by plastic and plastic bag pollution create everlasting, detrimental effects upon the environment. The extent of harm created by the disposed bags is not widely recognized by recipients. Instead, plastic bags have solidified their way into the habitual nature of a grocery store visit. Unrecognized by the public, plastic bags are one of the largest portions of waste in the world today. Efforts to sway individuals to adopt reusable bags have been underway for some time. Transitions of reusable bags into shoppers' habits have not been significant enough to reduce the distribution rates of plastic bags. Even with initiatives to get customers to bring reusable bags by offering incentives and rewards for their usage, there has been no significant decline in distribution and consumption.

This trend has led government officials in developed societies to put this issue into legislation. Various governments around the world, including the United States and even California, are beginning to recognize the necessity of the mitigation of plastic bags. Though each city or county has a different approach, the general common goal is to eliminate the distribution of plastic bags in major grocery stores, supermarkets, and pharmacies. If an alternative bag is not provided by the customer, many bans require anywhere from a minimum of a five-cent to a thirty-cent charge for a recyclable paper bag. The legislative ban on plastic bags is legitimized as a step towards minimizing the harmful effects to the environment and creating a less wasteful society. While this is only addressing a small portion of plastic waste, it is a step in the right direction towards eliminating unnecessary wasteful items and bringing attention to the societal problem of wastefulness in general.

## The History and Role of Plastic Bags

Curious of the man behind the phrase, “Paper or plastic?” When did grocery stores make the transition to integrating plastic bags into the shopping experience? Plastic bags have only been a part of the supermarket experience for the last forty-five years. In 1977 Gordon Dancy invented the plastic bag and revolutionized the shopping experience. Dancy observed wasteful utilization with paper bags and sought to save the trees. He invented the “T-shirt handle”: the cheaper, lighter, and more easily manufactured plastic bags that are used today (Burton, 52). Dancy revolutionized the shopping experience.

Little did Gordon Dancy know that this alternative to the paper bag would transform into an epidemic, becoming the number one bag used in grocery stores, pharmacies, retail stores and restaurants. Whether going to buy eggs or getting take-out, the plastic bag is the preferred and most common transportation vessel. The cheap, lightweight, and durable bag holds a shopper’s items for a short while until the bag is tossed into the garbage can without a thought of its’ environmental repercussions. The plastic bag has turned into another one of society’s easily disposable items.

In the last fifty years, our society has transformed into a throwaway society. From disposable razors to zip-lock bags to bottled water, society has a mindlessness about the amount of waste we produce. The average American generates 3.5 pounds of garbage a day, which translates to about 1,500 pounds per year, per person. This results in a combined 160 million tons of waste generated per year in America. The problem comes down to where all of this waste is discarded and where it ends up. Eighty percent of our garbage ends up in dumps, 9% is burned, and the rest is either shipped to a different state or even out of the country, recycled, or enters into the environment in the form of pollution (Pederson, 102-103).

## Oceans and Waterways

Marine debris, in general, poses a threat to the health of marine ecosystems. Marine debris contributes to the disruption of habitats, the health of marine life, and the overall tele-connectivity of our oceans. When addressing the contents of marine debris, the main contributor is plastic. This comprises up to ninety percent of the floating debris in oceans (Gordon, 10-15). According to the International Coastal Cleanup Committee's 2009 cleanup, plastic bags were the second most common item of marine debris ("Trash Travels, 2010 Report", 11). Although this was a small study, the significance of plastic bags making their way into the ocean is a profound but avoidable problem. Eliminating one-time-use plastic bags will help decrease the harm that marine debris have upon the ocean environment.

Since plastic is the major contributor to marine pollution, plastic bags play a role in the amount of marine debris that disrupts habitats and ecosystems in the sea. Depending on the surrounding environment, a plastic bag can take hundreds of years to biodegrade ("Carrier Bag Report"). This results in the accumulation of plastic bags and plastic bag particles in the ocean.

Some of the major phenomena with marine debris that disrupt habitats are the great floating garbage patches that exist in the oceans. There are at least five known garbage patches in the world covering millions of square kilometers of ocean surface. These "garbage islands" are formed through the natural currents of the oceans. The currents carry the debris to giant pools called gyres. These gyres stimulate a whirlpool effect, concentrating and trapping debris. The biggest patch, roughly the size of Texas, is located near the Hawaiian archipelago. Plastic in general is, again, the most abundant type of litter found in these patches. It is estimated that more than thirteen thousand visible pieces of plastic litter are found in every square kilometer of the

ocean. This contributes to the condensed patches of debris that float in the sea (“Tracking Plastics in our Oceans”). These unnatural patches can affect the surrounding marine life, latent heat production, and disrupt the overall natural environment of the area of the patches. Again, eliminating the plastic bag, however small the act is in comparison to the amount of total debris, will help reduce the impact of these major products of marine debris and human waste.

Plastic debris in the ocean is common because of its durability and lightweight structure. Plastic, and plastic bags in particular, are easily picked up by winds, carried by streams, and blown into the ocean where they are much more difficult for people to reach them and control litter. When in the ocean, currents and waves constantly churn the plastic, breaking it down into smaller chunks and microscopic particles. These fragments are then weathered by the sun and often are mistaken as food by marine life (Gordon, 22). Depending on the surrounding environment, a plastic bag can take anywhere from 15 to 1000 years to biodegrade. Since plastic and plastic bags take decades and even centuries to degrade, the persistence of these items in our oceans will continue to exist and accumulate for years beyond their point of creation. Eliminating plastic bags will help mitigate this problem by bringing in less pollution to the ocean.

Not only are habitats of animals disturbed by the accumulation of plastic and other marine debris, but the health of animals in the oceans are also greatly affected. The most dangerous form of pollution for marine animals is plastic (Tertini, 14). Many marine animals’ lives are threatened and taken by plastic and plastic bag pollution. It is estimated that over 100,000 marine animals die every year because of the accumulation of plastic debris in the oceans (“Campaign Against the Plastic Plague Background Info”) and that over one million birds die every year from plastic pollution (“Carrier Bag Report”). One of the various ways that this

occurs is when plastic bags are mistaken by marine animals to be jellyfish. Marine animals such as the loggerhead sea turtle, seals, dolphins, and whales often consume the bags under the impression that they are eating jellyfish, causing the animal to choke, and die. Plastic bags can also accumulate in the stomachs of animals, resulting in a variety of health problems and eventually death. In one case, a sperm whale was found to have fifty plastic bags lodged in its throat (Tertini, 15).

Plastic and plastic debris in our oceans is a man-made, unnatural phenomenon that is bound to have repercussions on ecosystems and animals within those ecosystems. Entire food webs can be affected. The micro-plastics and other debris that accumulate on top of the surface can block sunlight from reaching organisms below. Giant garbage patches have an overwhelming effect on the amount of sunlight being absorbed by those regions. Blocking the sunlight entering the ocean negatively affects the plankton and algae below, inhibiting their growth. Algae and plankton are organisms that produce their own nutrients from oxygen, carbon, and sunlight. These communities are threatened when the debris blocks sunlight and nutrients from reaching them. Many animals in the marine community depend on algae as their primary source of nutrients. Animals such as fish and turtles will in turn be affected if the population of algae and plankton decreases. Consequently, animals that feed on fish and turtles, such as tuna, sharks, and whales may also suffer (Ramroop). It is important to be aware of how a single-use plastic grocery bag will hold your eggs and bread, but may end up littering the oceans and contributing to the overall harm of marine debris. Plastic and plastic bag pollution has consequences affecting marine life in many ways: harming habitats, marine life, and the overall food web.

Before plastic bags reach the ocean, there is also the possibility of them clogging waterways such as gutter systems and storm drains. This could result in the possibilities of overflows and larger-scale floods. This is especially a problem if combined with sewage, often creating the perfect breeding grounds for bacteria, germs, and insects. In Delhi, the most senior bureaucrat of the “environmental department, blamed plastic bags for the 2005 floods that killed hundreds in Mumbai” (“Heavy Baggage”). Similarly, in 2002, Bangladesh established a ban on plastic bags after attributing the accumulation of plastic bags in the sewer systems to be the primary cause of the 1989 and 1998 floods that killed hundreds of people. At the time of the ban, environmental groups calculated that more than nine million plastic bags were being dumped in the city daily with only ten percent actually reaching a garbage bin (“Plastic Bags Continue to Clog Bangladesh”). Most of the remaining bags, with an obvious lack of strict waste disposal requirements, were released into the environment, many of which ended up in the drains and sewers. There is also concern when the polythene remains infiltrate into the soil and decrease the soil fertility. This could potentially cause an impediment to food production, which for Bangladesh, along with many other less developed countries, could be detrimental to their economy and livelihood. According to the UN World Food Programme, Bangladesh is “losing one percent of arable land every year, in part due to erratic rains and land degradation,” both of which are obviously not attributable to plastic bag waste in any sense, however people should be doing everything in their power to decrease negative impacts on the environment. This could eventually have negative impacts, especially in the form of floods (“Plastic Bags Continue to Clog Bangladesh”).

While not all floods can be attributable to the clogging of drainage systems by plastic bags, it is tragic to see that these two countries suffered human deaths from a seemingly

minuscule object of convenience. It took death for governments to make an effort towards decreasing usage. The rest of the world must take what has happened in both India and Bangladesh as a lesson, and take action to combat such an incident from happening again.

### Landfills

America has an over-reliance on landfills; eighty percent of America's garbage ends up in landfills (Pederson, 103). As population increases, the amount of total waste produced increases as well. In accordance with more waste, landfills are becoming less available and the hazards involving them are increasing.

Until the 1930's, most landfills were open dumps, which were hazards to ground and drinking water. These dumps had no protection or lining, which threatened the conditions of the surrounding areas. The sanitary landfill began to be implemented in the 1930s, which provided a clay or plastic lining that protected the ground and drinking water of the surrounding areas. Although these landfills are predominant today, most of them are unmonitored and still prone to hazards to the surrounding environment (Fisher, 9). The newly lined landfills have their fair share of problems. However, the lining will eventually break down and leak toxic materials into the groundwater. In a 2008 survey, it was found that 82% of landfills had leaks and were emitting toxins into the surface and ground water ("Waste and Recycling Facts").

In addition to the hazards surrounding the monitoring and upkeep of modern sanitary landfills, other restrictions and concerns surround landfills as well. While landfills are in operation, vast chunks of land are dedicated to the landfill and restricted from other uses for years to come, even after the landfill is closed. Also gas emissions, vermin and scavenger problems, hazardous runoff in the water supply, litter control of surrounding areas, and economic



concerns all involve landfills (Fisher, 12-14). The hazards surrounding landfills in many situations are not monitored and up to date. An Environmental Protection Agency surveyed about 6600 municipal landfills in the United States and concluded that:

- 6% are located on wetlands
- 14% are located in floodplains
- 35% are located in areas defined as seismically active
- 39% have no runoff collection controls
- 64% have no ground water monitoring capability
- 72% have no liners (natural or synthetic)
- 78% have no leachate collection systems
- 98% have no methane control system (Fisher, 15).

There are many potential hazards caused by the creation and usage of landfills. In order to reduce the negative impacts, the over-reliance on them must be lessened. This first starts by cutting in areas where it is affordable.

Plastics account for over 20% of the waste volume in landfills (Gore, 200). The cheap and abundant substance is overwhelming in society today and has established itself as a major component of landfills. Plastics are resistant to natural decay and, when buried in a landfill, are unable to decompose due to the structure of a modern landfill. The dense, dark, oxygen deprived landfill does not allow sunlight to penetrate, and here, plastics can last for hundreds of years (Pederson, 104). Certain plastics buried underground in landfills are known to give off poisonous gases. One plastic in particular is PVC. PVC is a type of plastic compound that gives off a gas called vinyl chloride. Vinyl chloride is very hazardous and has been known to link to liver cancers. Also, red and yellow types of plastic are harmful. They release a substance called cadmium, which if it gets into the ground water or surface water, can be hazardous to ecosystems, humans, and animals (Palmer, 12). Although there are many uses for plastic which are unavoidable, plastic, single-use carrier bags are an avoidable and unnecessary aspect of society. Banning plastic bags could lessen the hazards of landfills and plastics' contributions to

the hazards of landfills. Even though plastic bags are a small portion of waste, every year, Americans still use approximately one billion shopping bags. Plastic bags contribute to over 300,000 tons of landfill waste (“Waste and Recycling Facts”). Not only are plastic bags taking up unnecessary space and contributing to the growing hazards surrounding landfills in general, but transportation costs of getting them to the landfills are high. The state of California spends on average twenty-four million dollars transporting plastic bags to the landfills where they will continue to remain for decades (“Waste and Recycling Facts”). Once in the landfills, plastic bags, whether “degradable or not,” barely experience sunlight which further inhibits its chances to degrade (Pederson, 106). Instead, plastic bags will continue to hold their original form and continue to accumulate in landfills.

#### Creation and Production of Plastic Bags

Plastic bags, like most plastics, are made from crude oil and natural gases: nonrenewable sources. Crude oil and natural gas are refined into ethylene and propylene using high-temperature furnaces (“How Are Plastics Made?”). The next processes depend on what form of plastic is desired. It is estimated that one ton of plastic bags is equal to eleven barrels of crude oil (“Solutions”). In the United States alone, “an estimated twelve million barrels of oil [are] used annually to make [the] plastic bags that Americans consume” (Lohan). Also, harmful emissions are emitted during the manufacturing process of creating, not only plastic bags but, all single-use bags (“Carrier Bag Report”).

This is evident with various production processes and this is not to say that the emissions created during the process of producing a plastic bag are more harmful than producing other types of products. However, this is an area where society has a chance to reduce the portions of

harmful emissions going into the environment and further reduce our reliance on a scarce resource by eliminating the need and usage of single-use carrier bags.

### Where Usage Needs to Decrease

Plastic bags can be found in a variety of shopping experiences. Take-out, a new pair of shoes, a trip to Target, a loaf bread at the bakery: plastic bags can be found at many such venues. Like any type of litter, plastic bags affect a variety of ecosystems. Due to their lightweight structure, plastic bags can litter the land, our waterways, streets, and air. It is estimated that there are more than 500 billion new plastic bags in global circulation annually, many of which come from grocery stores (Wagner). The U.S. alone goes through 100 billion shopping bags annually (“Facts About the Plastic Bag Pandemic”).

The majority of plastic bags in circulation are high-density polyethylene bags with handles, found in grocery stores (“Report on actions to reduce circulation of single-use plastic bags around the world”). Due to this fact, grocery stores have been targeted as the major venue in reducing plastic bag use through plastic bag bans. Although the logistics of the ban depend on the ordinances enacted by the counties, the majority of the bans include grocery stores that have annual sales of two million dollars or more, over ten-thousand square feet of retail space, and/or contains a pharmacy (San Luis Obispo County Integrated Waste Management Authority). Stores that do not fit this description can still distribute plastic bags.

Depending on the surrounding area, certain grocery stores have the potential to yield more environmental hazards than others. Since San Luis Obispo’s ban is one of the major focuses in this paper, it is important to analyze the area’s grocery stores and which stores in the county would benefit most by implementing the plastic bag ban. For the following maps we used

Geographic Information System (GIS) software to determine the more crucial grocery stores in San Luis Obispo County that would benefit the environment the most by implementing the plastic bag ban. We geocoded the top 58 grocery stores in the county and plotted each location. We specified three criteria that would label a grocery store potentially hazardous based off of plastic bag distribution. First, that the grocery stores in close proximity to a major road would therefore serve the most people. Second, the grocery stores within a close proximity to a stream or ocean would more likely contribute to water pollution in terms of plastic bag waste. The last condition for a potentially hazardous grocery store would be its proximity to the Cold Canyon Landfill, which serves the most grocery stores in the county. We then took the results from all three conditions and found the grocery stores that fit all three of the hazardous conditions. Those grocery stores that are closest to a major road, closest to the ocean or a stream, and use the Cold Canyon Landfill are labeled as the most potentially hazardous grocery stores. These grocery stores would have the most potential impact in reducing plastic bag hazards when the plastic bag ban is implemented in San Luis Obispo County.

Grocery stores and their proximity to major roads would potentially effect the amount of customers that each store would receive (Figure 1), therefore resulting in more plastic bag usage at those stores. We concluded that grocery stores within one mile of a major road would fit the criteria of being considered a conveniently located grocery store and therefore serve more customers. The inconveniently located grocery stores, under these conditions, would potentially serve fewer customers and would therefore be less crucial in making a substantial difference in reducing plastic bag waste when the ban is implemented.

Grocery stores and their proximity to streams and oceans (Figure 2) are possibly more likely to contribute to plastic bag waste and the hazards that surround them in water bodies. We

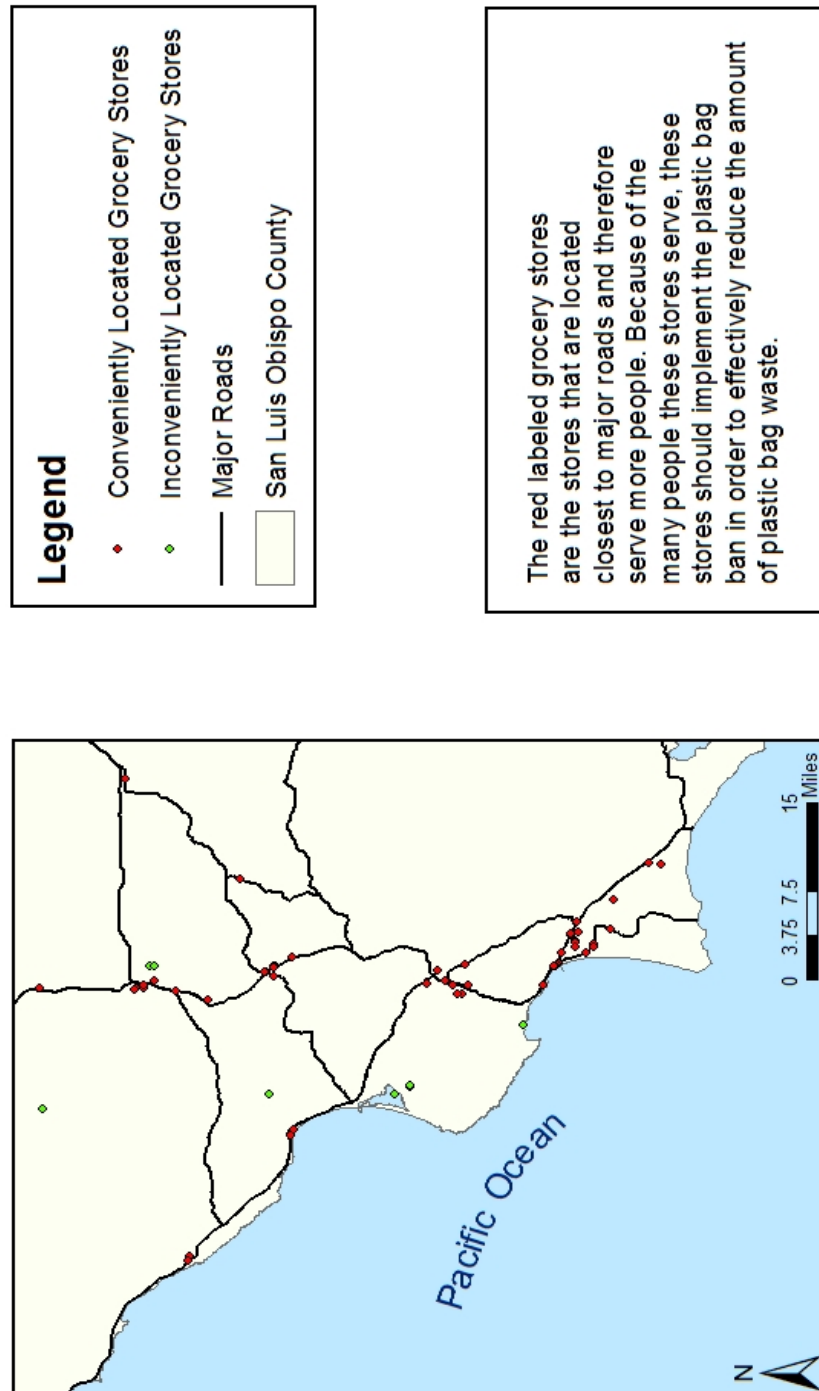
concluded that grocery stores within a half-mile of a stream or ocean are potentially the most hazardous and therefore would more positively affect plastic bag hazards when the ban is implemented in these stores.

In order to determine which grocery stores would benefit the environment most by implementing the plastic bag ban, we geocoded the three landfills in the county and plotted their locations (Figure 3). We did a spatial analysis determining which grocery stores were closest to each landfill. It was determined that most grocery stores are within closest distance to Cold Canyon Landfill. This led us to conclude that the majority of grocery stores in SLO County use Cold Canyon Landfill. We then labeled Cold Canyon Landfill and the closest surrounding grocery stores as potentially having the greatest positive impact of reducing waste if those stores were to implement a ban on plastic bags.

Out of the 58 grocery stores in SLO County, 22 fit all three criteria of the previous maps (Figure 4). When the plastic bag ban is implemented, these grocery stores will have the most positive impact in reducing plastic bag usage and plastic bag hazards in the county.

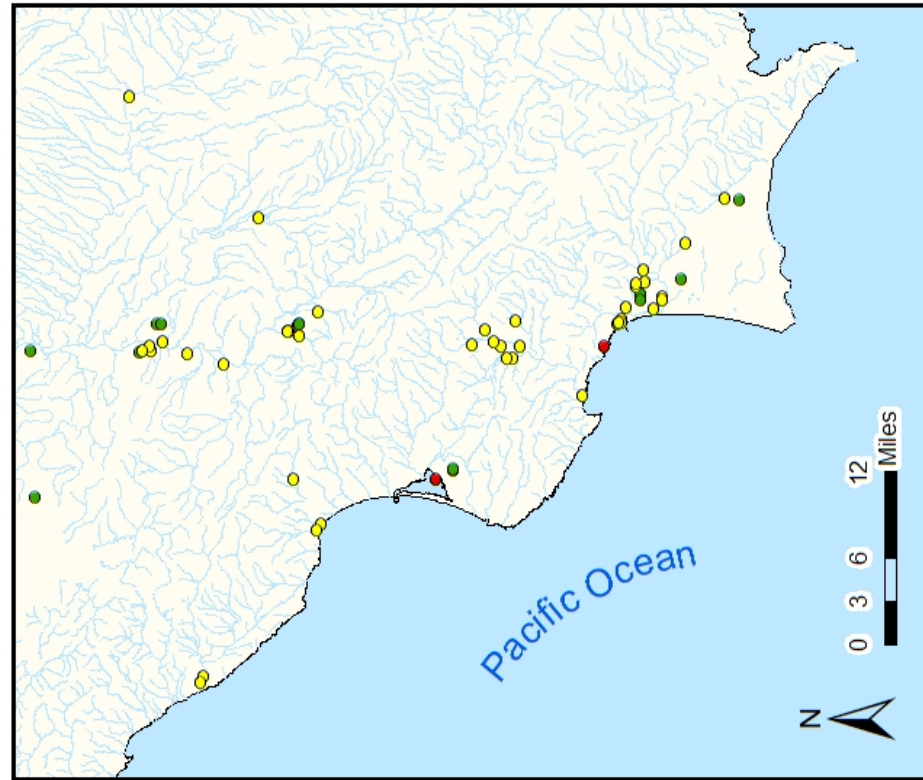
# Grocery Stores and their Proximity to Major Roads

**Figure 1**



**Figure 2**

## Potentially Hazardous Grocery Stores to Water Bodies



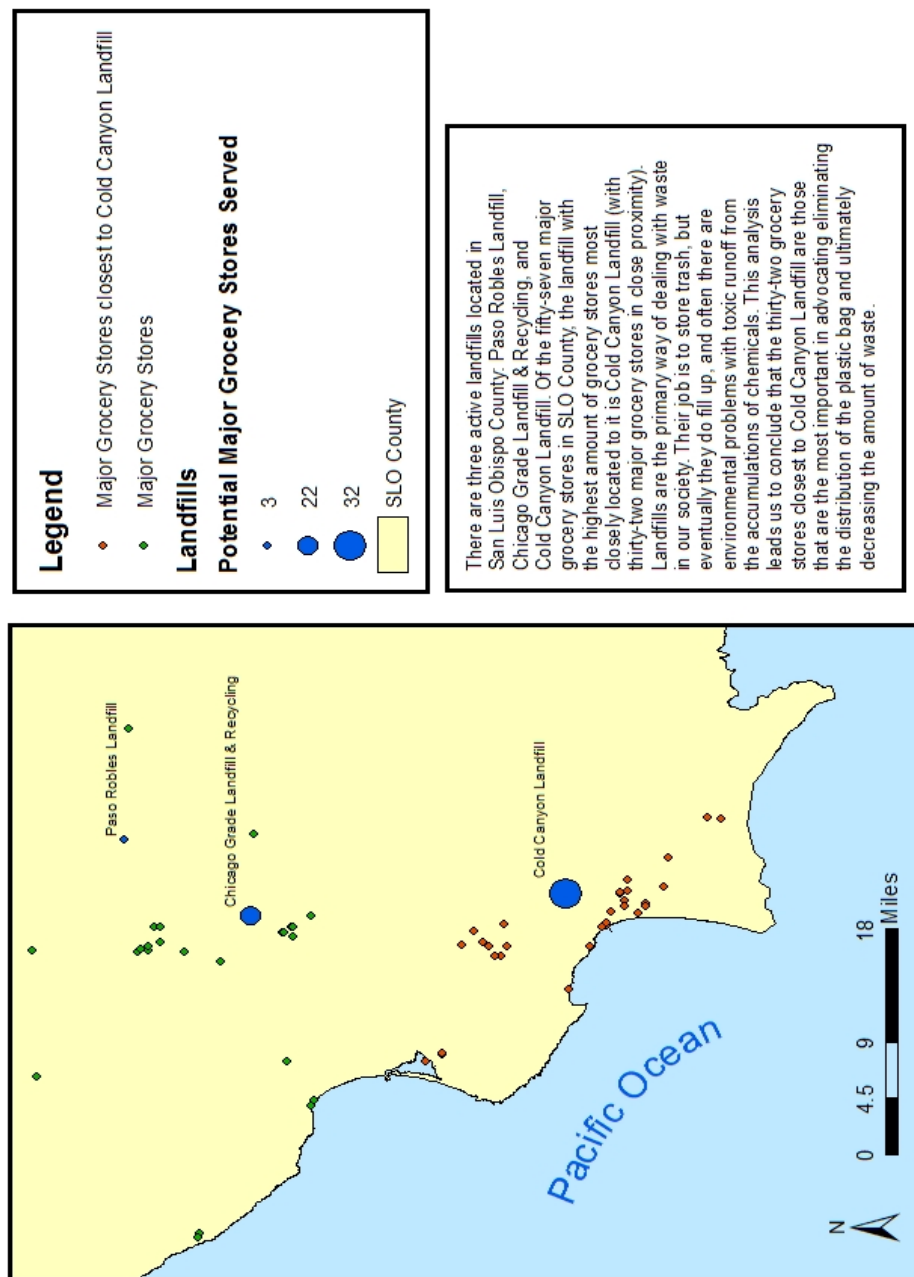
### Legend

- Grocery Stores Potentially Hazardous to the Ocean
- Grocery Stores Potentially Hazardous to Streams
- Grocery Stores Furthest From Streams
- Streams
- SLO County

Plastic bags are harmful to wildlife in and around water bodies. They created a major pollution problem that fresh water animals and marine life encounter. Grocery stores that are located near streams and oceans are more likely to contribute to plastic bag pollution. Although the Plastic Bag Ban has already been passed in San Luis Obispo County, it is important to consider which grocery stores are nearest to streams and oceans. This information emphasizes the criticality that the ban will have on surrounding areas in reducing plastic bag waste and the overall hazards that they can cause.

**Figure 3**

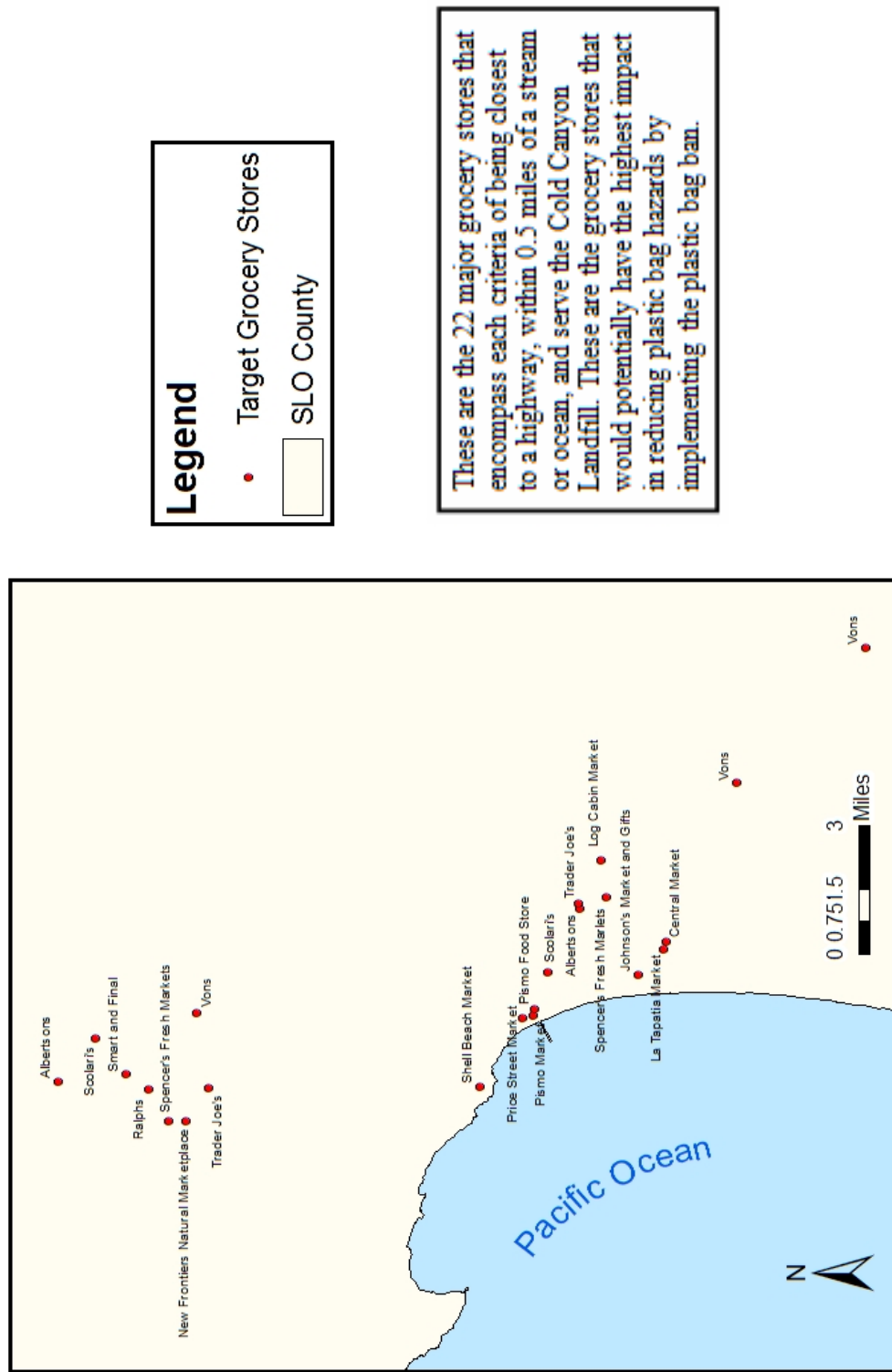
## Major Grocery Stores in Relation to Landfills in SLO County





**Figure 4**

## Target Grocery Stores for the Elimination of Plastic Bags



## The Argument for the Mitigation of Plastic Bags

Though there have been various efforts to reduce the usage of plastic bags, nowhere has there been significant drops in usage until regulatory legislation was put into place. Efforts such as discounts for bringing reusable bags or advertisements for purchasing reusable bags have not decreased consumption of plastic bags in comparison to rates after legislative involvement. In order to make a difference and reduce usage of plastic bags, legislative involvement is necessary. Although many people may have the intent to bring reusable bags to their grocery store visits, the lack of penalty is allowing for no dramatic decreases in usage.

One of the main components of the plastic bag ban is the extra cost per bag to the customer if a reusable bag is not brought. This part of the ban results in a consequence for the customer resulting in a more conscious grocery store visit. In theory, this could also reduce overall consumption in one-time usage bags.

This type of plastic bag ban has been implemented in various places around the world and reduced plastic bag consumption in those areas significantly. For example, Australia introduced a plastic bag tax of 15-30 cents per bag in 2003. In two years, baseline consumption of plastic bags was reduced from 5.95 billion bags to 2.92 billion bags. Not only did this tax reduce consumption by approximately 44% but a survey was also done that concluded that over 85% of smaller retailers were aware of the code, and one in four stopped using plastic bags entirely (“Report on actions to reduce circulation of single-use plastic bags around the world,” 8-9).

Another example of plastic bag ban implementation is in China. In 2008, China banned the production and use of plastic bags. Retailers were permitted to place a charge on other carryout plastic bags that were thicker in comparison to the typical HDPE plastic bags that are typically seen and distributed in grocery stores. This could potentially reduce in plastic bag use

by two-thirds. Prior to the ban, China, on average, consumed three billion plastic bags daily (“Report on actions to reduce circulation of single-use plastic bags around the world”, 15-16). In China, we see that the legislative ban had a significant impact in reducing plastic bags.

In the United States especially, many people are skeptical of government involvement and whether it is necessary. Countless ordinances, similar to the ones passed in Australia and China, have been proposed and dismissed in many cases (“Report on Actions to Reduce Circulation of Single-Use Plastic Bags Around the World,” 25-29). The oppositions attribute the ban to be unnecessary in the broader scheme of environmental hazards. Arguably, the plastic bag ban could potentially be considered “one step at a time” legislation. “One step at a time” legislation, as seen in the famous court case *Railway Express vs. New York* (1949), shows how small legislative measures can aid a larger cause. In the court case, the state of New York claimed that companies could only put their own advertisements on trucks. This was part of New York’s larger goal to cut down advertisements in the city to reduce traffic and pedestrian hazards. This type of legislation allows small legislation to pass if there is a greater progressive goal. It is an example of small steps taking action to solve a giant problem.

This same type of legislation is applicable to the ban on plastic bags. Although the plastic bag ban is not solving the waste problem as a whole, it could be considered as a step in the right direction towards making a difference. Overall, legislation banning plastic bag use could lead to the inception of new positive environmental policies. The government’s involvement in an issue that should not be looked upon as a small government versus big government issue, but rather as a changing of personal habits that can benefit society as a whole.

#### The History and Evidence from Various Bans on Plastic Bags

At the turn of the millennium going green seemed to have become “in” and almost trendy in American society. With much talk of global warming and former United States Vice President Al Gore’s movement to educate the country about it with *An Inconvenient Truth* in 2006, the environment and the human impact on it seemed to gain much more public attention. Citizens all over began showing efforts to become less wasteful and more environmentally friendly, or at least the desire for such efforts. The debate about global warming had existed for some time but new attention was directed to it and people were backing both sides with a new fervency. People and companies were looking for ways to market going green and reducing human impact on the environment; popular merchandise companies starting coming out with reusable cloth bags that made a statement reading, “I am *not* a plastic bag.” Popular acoustic musical sensation Jack Johnson even came out with a single entitled “Reduce, Reuse, Recycle.” Although the United States is considered to be the leading producer of waste in the entire world, we have been slower than many countries in making an effort towards decreasing the gross amount of waste we produce. This is also the case with plastic bags (Malone). Long before Americans had made it “cool” to be carrying around reusable bags, many cities and countries in Europe had already begun implementing laws in efforts to significantly decrease the usage of plastic bags in a variety of different ways.

In 2002, the Government of the Republic of Ireland became the first country in the world to place a bag fee or PlasTax on plastic bags in all supermarkets, grocery establishments, pharmacies, service stations, and all other sales outlets. Throughout the country, the amount of litter seen on the landscapes could not go unnoticed and recycling methods and encouragements were obviously not getting through to people. With the original PlasTax, stores still had plastic bags available at checkout but customers were required to be charged €0.15 per bag at points of

sale (Convery et al. 1). Before the tax was implemented it was estimated that an average of 328 bags were being used per person per year (“Plastic Bag Reduction Around the World”). After implementation of the tax this number dropped to twenty-one bags used per person per year. There was an impressive ninety percent reduction in the use of plastic carrier bags (Convery et al. 1).

The entire mindset of Ireland’s population had changed. In a *New York Times* article that discussed the outcomes of the country’s plastic bag tax, a civil servant in Ireland was quoted explaining that even if he had forgotten his reusable bag, he would “just take the cart of groceries and put them loose in the boot of the car rather than buying a bag” (Rosenthal). The primary purpose of the tax is not to generate revenue but to provide a punishment for using a plastic bag in efforts to get customers into the habit of bringing their own reusable bag and Ireland’s tax proved to be extremely effective in doing so. It changed the habits of people, turning using a plastic bag into simply a socially unacceptable way of being. Paying the tax and purchasing a plastic bag represented a sense of laziness and a direct expression of carelessness for the environment. In Europe, people nonchalantly lug suitcases to and from the grocery store, dropping products into their suitcase as they move up and down through the aisles. This type of behavior is considered normal; a practical and conscientious way to transport your items. In the United States dragging a suitcase through a Safeway or an Alberstons would draw eyes and turn heads; a ban and a charge on single-use bags will encourage customers to perceive using a single-use bag as more abnormal than using a reusable bag and will help in changing the mindset and habitual nature of customers in expecting that a bag will be provided for them.

Even one year after the implementation of Ireland’s Plastax there was a noticeable successful outcome in the litter found on the landscapes. According to the notes by the National

Litter Pollution Monitoring System, “plastic bag litter accounted for 5% of national litter composition before the introduction of the levy” (Convery et al. 7) However in 2002, once implementation had begun, that number fell to 0.32%, and then in 2003 to 0.25%, and then to 0.22% in 2004. Considering plastic bags’ long lasting, non-biodegradable nature, these results are astonishingly high.

As for the profits collected from the tax, the country established an Environmental Fund that was controlled by the Minister for the Environment, Heritage and Local Government, and was geared towards promoting education and providing support of other various environmental programs (Convery et al. 4). The first year after the tax had been implemented, the Fund collected an estimated €12 million in revenue and the following year the revenue increased to €13-14 million which “could be evidence of slippage in behavior of consumers [though] it most likely reflects delays in the implementation of the scheme by some stores” (Convery et al. 6). The funds generated allowed the Environmental Fund to facilitate money back into the environment and provide efforts to help undo the harm already done through the production and disposal of previous plastic bags. It is not to say that the money being raised is fixing all the harm that has already been done, but it is surely a step in the right direction.

After four years of implementation of the Plastax there seemed to be a slight increase in usage to thirty-one plastic bags used per person per year (from the initial drop to twenty-one bags per capita), which prompted the government to increase the tax to €0.22 per bag, creating a subsequent decrease closer to initial reduction results (“Plastic Bags”). While there are many ways to attempt to decrease consumption and usage of plastic bags, Ireland serves as a clear example of a country providing a punishment for using a plastic bag, and that punishment directly deterring people from usage.

Various places all over the world have attempted to use education as a means of deterrence. Education is one of the most vital tools in getting through to any individual however the true challenge is getting people to act on what they have learned and believe in. As it is often said, your beliefs don't make you a better person, your behavior does. In the 1990s in California, there was a law passed that required all major grocery stores to have a bin visibly located on the premises of the store that was devoted to the recycling of plastic bags (Romer, 445). The law also required stores to sell reusable bags at checkout in addition to displaying an effort of educating and encouraging customers to recycle. Plastic carryout bags were also required to have an emblem stating that they should be recycled in a visible location on the bag. After ten years of this at-store recycling program California's recycling rate was still below two percent (Romer, 445). This is not to discount that the stores and companies were not doing a good job at promoting the recycling of single-use bags, nor that customers were still ill-informed about their dangers and harms to the environment, however people were not taking action. It is easy to care about the environment but it is difficult to get people to act on their cares. This is what has led governments all over the world to begin to take firmer measures to decrease the usage of single-use bags. Providing a penalty or a punishment seems to instill deterrence in people more than just knowing how bad their choice may be.

In 2009, the Washington D.C. City Council unanimously passed to establish a 5-cent tax on all plastic and paper bags distributed. Under this law: "regulations created by the D.C. Department of the Environment, bakeries, delicatessens, grocery stores, pharmacies and convenience stores that sell food, as well as restaurants and street vendors, liquor stores and 'any business that sells food items,' has to charge the tax on paper or plastic bags" (Craig). The primary reason for the legislation, which was called the Anacostia River Cleanup and Protection

Act, was to help control and decrease the pollution to the Anacostia River and its surrounding areas (Craig and Turque). While plastic bags were not the sole pollutant to the river, people noted their conspicuous heavy prevalence and thought a ban would be the best way to achieve a significant reduction of impact. Years and even decades of recycling campaigns were still allowing for a tremendous amount of litter. Of the 5-cents charged to the customers, one cent went back to the businesses requiring the charge, and the other 4-cents went towards a fund dedicated to cleaning up the Anacostia. While 5-cents may seem too minuscule to make a difference, during the first month that the tax was implemented, beginning on January 1, 2010, \$150,000 was generated towards the fund (Craig). But the purpose of the tax was not to generate revenue, it was to eliminate customers' usages and decrease the litter to the Anacostia River and the Chesapeake Bay watershed, which is exactly what it ended up doing.

It was recorded in the annual Alice Ferguson Foundation watershed cleanup of 2010, the following year after the Washington D.C. tax was implemented, that there was a 50% decrease in the number of plastic bags found (Riley). The Office of the Chief Financial Officer estimated that in 2009, the year before the tax had begun, an average 22.5 million bags were being issued per month. According to the D.C. Office of Tax and Revenue the number of bags used in January dropped to 3.3 million bags since the law had been implemented on the first of that month. This shows an 85% reduction in the usage of plastic bags. Like similar taxes, there seems to be a trend of an initial substantial drop and then a slight increase. In September of 2010 a group of large grocers including Giant, Safeway, and Harris Teeter had reported that the customers' bag usage had fallen to 60% (Riley). However this significant of a decrease in usage is still an extremely valuable outcome of the tax and should be considered important for what it does for the



environment because at this point, after all of the plastic bags that we have created, wasted, and dumped back into our environment, any decrease will help and is worth the cost.

In 2007 San Francisco became the first city in America to ban plastic bags. The ban applied to all large supermarkets, grocery stores, and pharmacies that earned over two million dollars a year (McKinley). Grocers were only permitted to distribute biodegradable bags and charged a minimum of a 10-cent fee for distributing paper bags. (Businesses are free to increase the fee to any amount above the minimum). After the ban was implemented, the city saw an estimated drop of five million fewer bags per month (Gorn).

However, despite obvious success stories from other countries and cities around the world, California municipalities are having an exceptionally difficult time getting bans and taxes on plastic bags passed. This is primarily due to the California Environmental Quality Act, commonly referred to as CEQA. The State of California's Governor's Office of Planning and Research describes CEQA, created in 1970, as follows:

CEQA exists to ensure that governmental decision-makers consider the potential significant environmental effects of proposed projects before taking action. The lead agency is responsible for determining whether a significant adverse environmental impact may occur and whether it can be mitigated to a level of insignificance. Where substantial evidence indicates that a significant adverse effect may occur, the lead decision-making agency is required to prepare an Environmental Impact Report (EIR) which discusses in detail the potential impact and feasible means of avoiding or reducing it. (Cervantes et al.)

#### Counter Arguments Against the Ban on Plastic Bags

Various plastic bag manufacturing companies, and various coalitions against the ban on plastic bags particularly the Save the Plastic Bag Coalition and the American Chemistry Council (whose Plastics Division "represents the leading manufacturers of plastic resins") have taken very extreme efforts to eliminate and fight against bans on plastic bags ("Plastics"). There have

been countless lawsuits filed against various municipalities in California by plastic bag manufacturing companies by focusing the argument on the negative environmental impacts of the paper bag. They argue that the ban on plastic bags will encourage and directly increase the number of paper bags used and that such ordinances banning the plastic bag falsely claim that plastic is a severe threat to the environment when, as the plastic manufacturing companies claim, it is not.

Such counter-arguments are what have prompted the strict emphasis and requirement for cities to conduct an Environmental Impact Report (EIR) to back up their ban and explain the specific environmental impacts that would legitimize a ban on plastic bags. Any valid project and legislation should be able to support itself with a substantial EIR solidifying the validity of environmental hazards surrounding plastic bags. Various cities have executed well-supported EIRs, which have been successfully passed by government decision-makers and boards. However, the problem has become an issue of money; smaller, less wealthy cities and counties' attempts to implement a plastic bag ban are currently being slowed because of lack of funding due to the costly nature of compiling an Environmental Impact Report. Meanwhile, those who ardently protest a ban on plastic bags and express their concern for the negative effects that paper have on the environment do not suggest or show any means of helping mitigate the pollution that paper bags create, nor provide a better alternative to a ban besides the promotion of recycling (California rates have not significantly increased over the decades of endorsements by stores and governments). So it seems that while those who protest a ban on plastic bags are supposedly showing concern about the environment, they are not. They do not offer up any serious plan for reducing the negative impacts done to the environment which they claim to have so much

concern about, which is simply the only goal of a ban on plastic bags: to reduce the negative human impact that gross plastic bag production and waste has created.

Plausible solutions by cities and stores to combat the lawsuits and to circumvent the high expenses that an Environmental Impact Report would cost, can be exemplified by the early stages of Fairfax, California's ban. Inspired by San Francisco's ban, as were numerous other cities and counties in California, Fairfax wanted to instate a ban. However they were unfortunately forced to abandon their ban "under the threat of a lawsuit by the plastic bag industry," that were claiming to sue on environmental grounds (Gorn). Fairfax, with a population of just over seven thousand was, as explained by Mayor Mary Ann Maggiore, unable to handle a lengthy lawsuit at the time (Gorn). But in an effort to persevere despite being presented by such obstacles, Fairfax decided to make the ban voluntary and in response, an overwhelming number of venues volunteered to stop distributing plastic bags until a ban eventually did get passed in 2008 ("Plastic Bag Ordinance"). There is growing opposition towards the ban, supported by companies in the plastic bag industry. Many cities, in addition to Fairfax, are being accused of encouraging the use of paper bags (by banning plastic), which have negative effects on the environment.

The reasoning of this accusation is partially valid in that it is true that paper bags should never be considered good for the environment in any sense. Paper bags are made from trees which are a finite resource. Trees are over-consumed and have an irreplaceable value in ecosystems and climate. Using trees for the production of disposable bags is not a sustainable practice. However, the argument needs to be considered in relation to the larger comparison to the production of plastic and its harmful effects on the environment. It is a wasted argument to compare which is worse for the environment –the production and overconsumption of paper or plastic bags –because both have their indubitable evils. In fact many would agree that there

should ultimately be a ban on both. The purpose of the plastic bag ban is to slowly ease consumers into a habitual pattern where neither paper, nor plastic is used for one single usage, and reusable bags are the reigning form of short-distance transportation of goods at primarily supermarkets, grocery stores and pharmacies (though the elimination of the use of them everywhere is the ultimate goal).

### San Luis Obispo County's Plastic Bag Ban

Below is a brief summary of *The Official Ordinance to Ban Plastic Bags in San Luis Obispo County*:

The Integrated Waste Management Authority of San Luis Obispo found it necessary to establish a waste reduction and reuse program in San Luis Obispo County. The ordinance outlines the purpose, the terms, store responsibility, and overall enforcement that will occur once it is enacted.

#### *Purpose*

The overall purpose of the plastic bag ban is to increase sustainability of environmental practices, and establish a cost effective strategy for doing so. Reducing the amount of single use plastic bags in SLO County each year is a sustainable component that will reduce the amount of waste and reduce the environmental impacts that surround one-time-use plastic bags. Banning the plastic bag will work positively to maintain natural resources and protect the local environment from excess litter in our landfills, streams, oceans, and streets. In addition, the ordinance addresses that carry-out bags are not free for the stores. Enacting this ban will allow stores to recover their past costs of providing them.

### *Terms and Definitions*

- The ordinance applies to the seven cities in San Luis Obispo County including: San Luis Obispo, Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, and Pismo Beach.
- The “store” requirements include: an annual sale of two million dollars or more, over 10,000 square feet of retail, and/or contains a pharmacy. Stores that do not fit these criteria are not required by law to comply with this ordinance.
- A “recyclable bag” will be provided by the store with a minimum 10-cent charge when the ordinance is enacted if an alternate bag is not brought by the customer. These bags are to be made of 40% recycled material.
- “Reusable bags” provided by the customer or bought at a local store, are to be machine washable and not containing lead, cadmium or any other heavy metals.

### *Store Responsibility and Enforcement*

On September 1, 2012, the ordinance to ban plastic bags will be enacted. A recyclable bag will be available upon request of the customer free of charge until December 1, 2012 when a minimum of a 10-cent charge will be begin to be required. Every day that the stores under this provision fail to comply with the ordinance, the store will be fined one thousand dollars. Stores may have reusable bags for sale; however the ordinance states that any carry-out bag type provided by the customer will be acceptable. Since this official ordinance, there was a second draft which postponed the date of implementation to October 1, 2012.

### Addressing the Counter Arguments

The ban on plastic bags has brought about many critiques. There is a vast amount of literature supporting the ban and also in extreme opposition to it. One of the biggest critiques against the ban is that banning plastic bags suggests that paper bags are better for the environment and encourages the usage of paper bags. This is nowhere near true. The reason there is a greater focus and urge to ban the consumption and usage of the plastic bag is because they are currently being used at a much higher frequency than paper bags in grocery and pharmacy establishments. As discussed in Laura S. Friedman's *Garbage and Recycling*, in which the author discusses both the arguments for and against the ban on plastic bags, it states that the United States of America "currently uses only 7 billion paper sacks per year, compared to 100 billion plastic bags" (Friedman, 128). The higher prevalence of customers' choices for plastic bags compared with the option of paper or reusable bags were also clearly exemplified through our fieldwork observations at Trader Joe's and Albertsons, as well as our survey (see pages 31-38). The ban on plastic bags is not by any means meant to encourage the use of paper bags; instead, the goal is to completely stop single-use bag consumption and completely switchover to only using reusable bags. While this transition is happening, those who do not remember their reusable bags will be penalized with a small fee and provided with a paper bag which is not necessarily a better alternative for the environment. But in order to balance the scale of the sources of pollution it is a justifiable alternative in the meantime with a far less wasteful society, moving much closer to zero waste in transporting our goods and groceries, in the future. Also considering the numbers discussed regarding the implementation of the bans in Ireland, Washington D.C., and San Francisco, it is often the case that reduction in single-use bags in general drop immediately after execution of the ban.

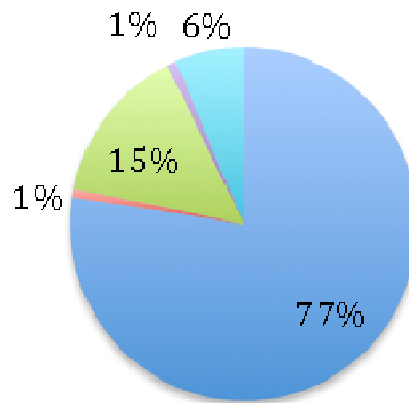
There are significant, extremely dangerous environmental hazards surrounding both plastic and paper bags, therefore it is not the intent to encourage either single-use option. Our society must move towards becoming less wasteful and only using reusable bags at supermarkets, grocery stores, and pharmacies, and ultimately all venues where they are currently being issued.

#### Field Work: Observations at Albertsons and Trader Joe's

In an effort to focus on the local area, we observed two grocery stores in order to get concrete data on the public's grocery bag preferences. For one hour we observed and recorded the types of bags that customers walked out of stores with. We first observed Albertsons at approximately 11:00 a.m. on a Friday. Our sample size was 124 total customers. Out of the total customers observed, 96 people walked out with plastic bags, 18 carried their items by hand with no bag, 8 people used reusable bags, one person asked for paper, and one person carried their items out with a box. There were a total of 162 plastic bags carried out within that hour. This study showed that when all the options for carry-out bags were available, i.e. paper, plastic, and bringing a reusable bag, 77.4 percent, the majority of the customers, overwhelmingly chose plastic bags.

## Albertson's Observations, Customers' Choice of Baggage

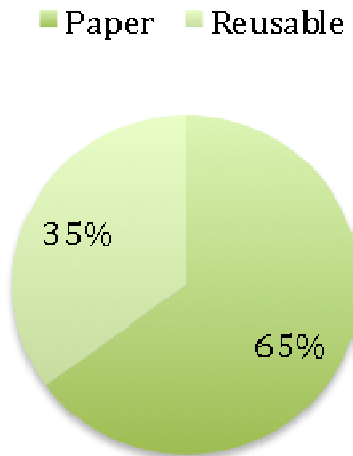
■ Plastic ■ Paper ■ No-bag ■ Crate ■ Reusable



We also observed Trader Joe's for one hour beginning at approximately 6:00 p.m. on a Monday. Since Trader Joe's does not have plastic bags as an option at checkout, we recorded the number of people who walked out with paper bags and the number of people who brought their own reusable bags. Our sample size was a total of 277 customers during that hour. Out of the total customers observed, 180 people walked out with paper bags and 97 people walked out with their own reusable bag. The study showed that the majority of people, 65 percent, did not bring reusable bags and chose to use paper bags. The remaining 35 percent chose to bring their own reusable bag.



## Trader Joes Observations, Customers' Choice of Baggage



Comparing these two observations we can see a substantial difference in reusable bag usage. Trader Joe's customers used reusable bags 5.4 times more than the customers at Albertsons. There are several possible explanations as to why this occurred. The first possible explanation could be that Trader Joe's absence of plastic bags shows an effort to decrease waste in general. Eliminating the option of choosing plastic bags and promoting and selling reusable bags represents a more environmentally aware business, which resonates upon its customers. A second explanation as to why the customers at Trader Joe's brought more reusable bags could be affected by the incentives that are offered. Trader Joe's has a raffle every week rewarding customers who bring a reusable bag with gift cards and prizes. One reusable bag results in one raffle ticket. A third option could reside in the type of customer that Trader Joe's attracts compared to those at Albertsons. Trader Joe's reliance on more organic labels and lack of genetically modified foods could possibly attract customers who are more environmentally

conscious and, in turn, make more significant efforts to make an environmentally conscious decision during check-out. Another scenario could reside in the automaticity of Albertsons to give plastic bags. In order to get paper bags at Albertsons, customers must ask for them the majority of the time. This results in a mindlessness during checkout, where neither the customer nor the bagger is required to make a conscious effort for or against using an alternative carry-out bag.

We chose to analyze these two stores on the basis that one offered plastic bags and the other did not. Also, that one provided an incentive and the other did not. Clearly, in this observation, more customers brought their own reusable bag when a plastic bag was not available. Also, the increase in reusable bag prevalence could be attributable to providing an incentive for bringing a reusable bag. Overall, we cannot draw the difference of reusable bag usage to one particular explanation, but it is important to analyze the different approaches of both stores. It is also important to note that eliminating the plastic bag at Trader Joe's showed an increase in reusable bags brought by customers.

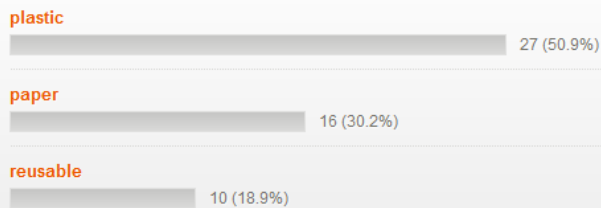
### Survey

In an effort to further evaluate the state, feelings, awareness, and actions of the public we created a short, concise survey that asked the following questions listed below. We advertised this survey via the online social network of Facebook though it was open to anyone, using the website <http://freeonlinesurveys.com/>. Based off of what we have researched on the trends and results of the greater population, our prediction before seeing the results of the survey was that people are currently predominantly choosing to use plastic bags at checkout in supermarkets and grocery stores (compared with paper and reusable). We also speculated, that people remain uninformed about the dangers that plastic bags can cause to the environment. Although most

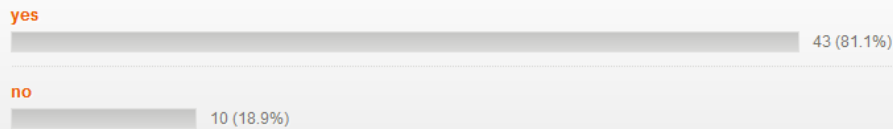
people would claim to care about the environment and that reducing impacts on the environment is considered important to them, they do not necessarily reflect that with their choices at checkout (by not bringing a reusable bag). We also hypothesized that while people may own a reusable bag, not many people use them or remember to bring them to their store visits; it is not habitual for even people that own a reusable bag to bring it to the grocery store.

There were fifty-three respondents and the questions and results are as followed:

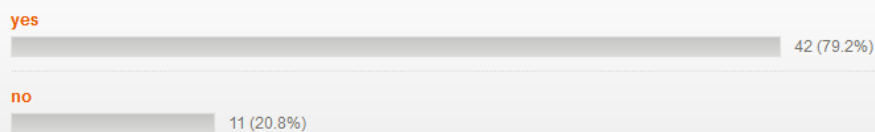
1) On a typical grocery store or supermarket visit, which type of bag do you usually walk out with?



2) Do you think plastic bags cause threat to the environment?



3) Do you own a reusable bag?



4) If so, how often to you use it at your store visits?

always

4 (7.5%)

usually

6 (11.3%)

sometimes

17 (32.1%)

rarely

10 (18.9%)

never

5 (9.4%)

I do not own a reusable bag

11 (20.8%)

5) Is reducing impacts on the environment of importance to you?

yes

49 (92.5%)

no

4 (7.5%)

6) Does your city or county currently have a ban on plastic bags?

yes

11 (20.8%)

no

37 (69.8%)

I don't know

5 (9.4%)

From question one we can gather that, based off of this population of respondents, 50.9% of the sample group typically walk out of the supermarket with a plastic bag, rather than paper at 30.2% or a reusable bag at 18.9%. As hypothesized, the type of bag used most often is plastic.

Question two evaluated the sample groups' knowledge about the environmental hazards involving plastic bags. Eighty-one point one percent of respondents said "yes," they do think that plastic bags cause threats to the environment, and 18.9% said no. We are concerned that this question may have been biased towards answering "yes," due to the overall subject matter of the

survey. We want to emphasize the importance of increasing the public's knowledge about the associated environmental hazards and that this, in turn, will decrease the likelihood of using a plastic bag and increase the prospects of bringing a reusable bag.

Question three asked if the sample group simply owns a reusable bag; 79.2% said "yes," while 20.8% said "no." Those that answered "no," exemplify that not all people feel an obligation to use reusable bags at their store visits. Without owning a reusable bag, it is likely that people will choose to use plastic at checkout.

Question four asked the forty-two people that said they did own a reusable bag, about their frequency of use. The majority of people said they "sometimes" used it, with a combined total of 18.8% answering with "always" or "usually" and a combined total of 28.3% answering "rarely" or "never." From these results we can deduct that though over 79% of the sample group claimed to own a reusable bag, only 7.5% "always" used it and 50.9% used it "always," "usually," or "sometimes." People are not remembering or not feeling a strong enough motivation to make them use their reusable bags. They might know that they *should* be using it, but this is not actually reflected in their actions the majority of the time.

Question five evaluated the sample groups' concern about the state of the environment and their personal impacts on the environment's wellbeing. As hypothesized, the vast majority of the group (92.5%) answered "yes," implying that reducing impacts on the environment are of importance to them, and only 7.5% said "no," it is not important to them. Most people do care about the environment and if precisely asked if an individual cares about reducing their impacts on the environment, they would answer yes, as shown in the results of the survey. However, considering what we know of the proven environmental hazards that plastic bags can cause to the environment, people continue to use plastic bags and ultimately contribute to the environmental hazards. While this is most likely due to a lack of awareness of the particular dangers

surrounding plastic bags in the environment, it also acknowledges that there is a large group of people who care about the environment but do not reconcile it in their actions, and change their habits on a daily basis. Such a situation calls for the requirement of the ban on the plastic bag due to the fact that people are not responding significantly enough to volunteer efforts to decrease usage, increase recycling, and discourage usage.

Question six asks the respondents about the status of the plastic bag ban in their own town. The question read, “does your city or county currently have a ban on plastic bags?” The possible answers were “yes,” “no,” and “I don’t know.” Twenty point eight percent of respondents answered “yes,” 69.8% of respondents answered “no,” and 9.4% answered “I don’t know.” Once the survey had already been issued, we realized that this question should have had a different selection of answers to choose from. People probably answered based off of what they see at the grocery stores and pharmacies that they currently go to. This is not necessarily incorrect however, it ignores what is currently under legislation. Many cities and counties have current bans that have not been officially implemented and possibly not widely publicized. With this question, we wanted to highlight that there are a significant amount of people that are not aware of the current status of their city or county’s stance on banning plastic bags, further emphasizing that awareness and education is not stressed enough. However, we feel respondents probably just answered what they assumed was correct for their city or county instead of what the exact up-to-date status was. In response to this question, we concluded that awareness of the ban in San Luis Obispo County is important. In efforts to educate and aware the public, we handed out pamphlets at a local grocery stores that provided the necessary information regarding the current ban (See attached).

Think Globally, Act Locally Challenge

On April 27, 2012 we participated in the “Think Globally, Act Locally Challenge” put on by Cal Poly’s Engineers Without Borders club. The goal of the club is to serve communities with sustainability to meet their basic needs, creating an all-around global awareness and enriched global perspectives by providing various activities and educational opportunities. The Engineers Without Borders’ mission is to support community driven programs by working with the local communities to encourage sustainable engineering projects.

The “Think Globally, Act Locally Challenge” was a two-weekend event that consisted of local community service projects, with the ending goal of doing a total of 2,000 hours of community service. The event collaborated with various community driven work projects in San Luis Obispo County. The two events that we participated in included the Bob Jones Trail river clean up and the Pismo Beach clean-up. We participated in these events not only to help the club by supporting their mission of sustainability and community service work, but to count the number of plastic bags found during our cleanups. We chose these areas specifically due to the hazards of plastic bags in our water sources, especially rivers and oceans.

The first event, the Bob Jones Trail river clean up focused on clearing the area of garbage and removing branches blocking the flow of the river. I was there for an hour and a half and during that time found 23 whole plastic bags or parts of plastic bags in and around the river. Overwhelmingly the plastic bag debris was the majority of the debris that we found around the river. The area where we worked and found all of the debris was a small 300 foot area. The small work area, the duration of the cleanup, and the amount of plastic debris found, provides apt testimony hazards of plastic bags in our waterways and the impact that the plastic bag ban will have on the local community.

The second event of the day was the Pismo Beach clean-up which focused on removing litter and clearing the beach of any other debris. We were there again for an hour and a half and during that time counted only 3 plastic bags found. Going into this activity we expected a higher number. We understand that the lightweight nature of the bags causes them to be easily blown and their prevalence on the beach would be limited. Taking this into account, 3 plastic bags found in about an hour is a relatively significant figure. Again, the purpose of participating in these local community service events was to further display the ability of plastic bags to affect our local environment and pollute our water sources. Although these were quick community service projects, they provide concrete examples of how plastic bags pollute the local environment. When the plastic bag ban is in place, the reduction of the litter in our community, especially rivers and oceans, will be affected positively.

### Creating a Successful Campaign

Implementing the plastic bag ban, as we have seen, reduces plastic bag usage significantly. However, the education and facts given to the public regarding the motivators behind the bag ban are slim. In order to create a successful campaign, one must first educate the citizens of the area affected by the ban. Many may be unaware of the hazards surrounding plastic bags and the avoidable consequences that result from a trip to the grocery store.

Secondly, making this information readily available would be the next crucial step. Putting quick facts of the hazards of bags close to check-out counters in grocery stores will enable people to make a conscious decision to support or disapprove of the ban. Instead of merely being told that the ban will be implemented, with readily available knowledge, people will be knowledgeable of the environmental impact plastic bags have and be much more aware of the situation. This will result in a greater consciousness during checkout decisions.



Another factor is to create incentives to use reusable bags in stores. Many stores provide a 10-cent discount for bringing a reusable bag. Also certain Trader Joe's provide raffles for bringing a bag. Incentives such as these create more awareness and raise awareness to bring reusable bags to a grocery store visit.

A hole in the current campaigns was highlighted in a study in Taiwan by the Environmental Design Research Association. The study focused on predicting the behavior of customers either buying or bringing a reusable bag in an area new to the bag implementation. Questionnaires were given to the people in the study asking their intentions in their next grocery store visit. The study found that behavioral intention did not affect the outcome of the customer. It concluded that the inconvenience of bringing bags to the store outweighed their intentions. Some suggestions to solving this problem were to either provide bag rentals or to encourage customers to leave reusable bags in their cars to counteract the inconvenience (San-Pui, 328-332). This study addresses an area of improvement in the current anti-plastic bag movement and campaign. Although people may be aware of the hazards surrounding any carry out bag at grocery stores and have the incentive to bringing their own bag, the inconvenience factor could override the effectiveness. Bag rentals, as suggested by the study, would be a possible solution by making reusable bags readily available to customers. Also, creating reminders and notices to leave the bags in the cars of the customers would be positive as well.

Overall, the ban on plastic bags is a change that could take time for the public to get used to. Giving customers a grace period when the ban is implemented should be acknowledged and incorporated into the process. As seen in the San Luis Obispo official ban on the plastic bag ordinance, there is a grace period of not charging customers for paper bags for two months to

allow the public to adjust. This is a crucial step for implementing a successful campaign for the mitigation of plastic bags.

### Alternatives to Plastic Bags

Paper, plastic, or neither? Choosing neither on a grocery store visit would imply that the customer has brought their own reusable carry-out bag. Reusable grocery store carry-out bags come in all shapes and sizes and in different types of materials. Canvas, insulated, and thicker plastic, all in a variety of colors and patterns, can often be found at the end of the checkout isle during a grocery store visit. As proved, alternative reusable bags are ideal in the grocery store process. These stronger and durable bags will contribute to the reduction of thousands of disposable, one-time usage carry-out bags.

Surprisingly enough, reusable bags have been targeted for their overall cleanliness and the potentially harmful effects upon health. A study done by the University of Arizona and Loma Linda University tested reusable grocery bags of shoppers in Los Angeles, San Francisco, and Tucson. The study found that 97% of those interviewed had never washed their reusable bag. It was found that the reusable bags carried food-borne bacteria threatening human health (“Reusable Grocery Bags Breed Bacteria, Research Say”). Although this is a major concern, the problem does not lie with the benefits and the overall role of reusable bags but with the knowledge of cleanliness by the customer. The customer should be informed by a possible disclaimer or reminder to wash their reusable bags. This is an area of improvement for reusable bag companies but does not justify the elimination of reusable bags.

### Conclusion

The hazards of plastic bags in our rivers, oceans, landfills, and to our resources encompass an imbalance to the overall role that plastic bags serve. Their short life holding groceries does not justify their long lasting presence in the environment. Plastic bags and other one-time usage bags represent the disposable, wasteful lifestyle that has been so natural to American society. Banning plastic bags is a step towards the right direction in making a difference in the habits of society, creating a more sustainable population.

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## Quick Facts

- The U.S. goes through 100 billion plastic shopping bags annually.
- Only 1-3% of plastic bags are recycled worldwide.
- Plastic bags do not biodegrade
- The most dangerous form of pollution to marine animals is plastic.
- Approximately 1 billion seabirds and mammals die each year by ingesting plastic bags.
- Plastic bags are a primary source of litter because they are light and aerodynamic, which makes them easily transportable in the environment
- \$25 million tax dollars in California goes to managing plastic bag clean up.
- It takes 8,300 barrels of oil to manufacture 100 million plastic bags.

## What You Can Do to Help

-Buy reusable, canvas bags at your local grocery store and even farmers market!

-Purchase reusable bags online at earth-friendly, globally conscious websites

[www.loveyourearth.org](http://www.loveyourearth.org)

[www.ecobags.com](http://www.ecobags.com)

-Recycle paper and plastic bags

- When you can try to always reuse plastic and paper bags to extend their life

-Stay updated with your local county ban by visiting Californians Against Waste website

[http://www.cawrecycles.org/issues/plastic\\_campaign/plastic\\_bags/local](http://www.cawrecycles.org/issues/plastic_campaign/plastic_bags/local)

## The Ban on Plastic Bags

**When:** On October 1, 2012, the ordinance to ban plastic carryout bags in San Luis Obispo will be in affect.

**Where:** In most supermarkets, convenience stores, and other shops.

**Why?** The harm that plastic bag pollution does to our oceans, rivers, streets, landfills, and wildlife is overwhelming in comparison to their function in society.



What it means for you: A 10-cent charge for paper bags if a reusable bag is not supplied by the customer.



## Making a Difference: Think Globally, Act Locally

The heavy dependence on plastic bag has grown in recent years. Due to the cheap and less energy intensive manufacturing process, plastic bags have been the ideal form of transporting groceries compared to the paper bag alternative. This over-reliance on plastic bags in many grocery stores has contributed to a worldwide problem of pollution. There is no one solution to the problem of pollution, but eliminating plastic bags is where the public can easily make a difference with little sacrifice to daily routine and everyday activities.

**SAY NO  
TO PLASTIC BAGS**



### Reducing Our Plastic Bag Use Will Help Our...

#### Oceans:

Plastic bags make up a significant and deadly portion of our ocean pollution. The most harmful pollution to marine life is plastic and plastic bags.

#### Landfills:

Our nations landfills are filling up and we are rapidly running out of ways to dispose of our trash. Plastics make up 8% of our trash and landfills. Eliminating usage in our stores will greatly contribute to reducing our trash problem.

#### Streets:

Clean up cost alone cost millions of dollars each year. Plastic litter clogs storm water systems, drains, and waterways. Eliminating them will reduce clean up cost and clear the streets.

#### Future:

Eliminating one-time-use plastic bags will help make a difference in promoting a less wasteful, globally conscious society.

**“There is simply zero justification for manufacturing plastic bags anymore, anywhere.” –Achim Steiner, head of the United Nation’s Environmental Program.**