

AN ANALYSIS OF COMMON POOL RESOURCE MANAGEMENT

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ABSTRACT

The use and management of common pool resources can cause problems with property ownership and usage rights. Rules, regulations and policy development are all necessary in ensuring proper management and control of these common pool resources. In this thesis I use Elinor Ostrom's framework on decision making methods and policy models to analyze the decisions common pool resource users make, and the policy approaches that can be used to address the overuse or misuse of these resources. In order to better understand managing institutions and the systems that oversee these resources, Ostrom's approaches and theories are illustrated through the operations of the Bureau of Land Management. The BLM directly manages millions of acres of public lands through the rules and regulations set forth in the Federal Land Policy and Management Act of 1976. The ongoing land use dispute with Cliven Bundy in Bunkerville, NV is used as an applied example to analyze the decision making of land dispute players, as well as question the effectiveness and efficiency of an actual managing institution. In conclusion it is seen that BLM policies are adequate for effectively overseeing public lands, but adherence to the regulations and strict enforcement is necessary for a cooperative relationship between management agencies and the individuals working with them.

Land ownership and property rights have been a foundation for the development of the United States. The relationship between the federal government, the state and the individual evolves and changes with the inclusion of regulations and policies. Through history and as applied in some situations, it is imperative that structures, expectations and regulations are in place to guide the actions of resource managing institutions. Elinor Ostrom has looked further into these relations and the problems and solutions that arise with land ownership and resource regulation. Ostrom lays a theoretical framework for the management of common pool resources. Individual action and decision is the foundation for issues with common pool resource management. Personal incentive plays a role in choice, and expected or desired outcome influences action. Without some standing managing institution to create rules and enforce policy with public resources and land management, communities and societies run the risk of resource depletion and elimination. Cooperation and understanding is necessary. The implications of a lack of regulation are severe, and the default alternative of no regulations is sure to result in a faulty outcome. Cooperation between the users and managers of resources allows for communication and understanding in the importance of conservation. Without a certain level of control, the result is individual choice based on personal incentive.

Managing institutions are not intended to be an authoritarian source of control, but rather a guiding force that works to ensure proper management of resources to prevent overuse. Elinor Ostrom's book, *Governing the Commons*, is focused on natural resources and regulations by these types of managing institutions. Ostrom asks what types of rules regulate systems, what type of interactions result, and what outcomes are eventually seen. An analysis of her research allows us to think about the importance of understanding regulation and management systems, as well as the governments, institutions and individuals behind resources and relations.

Common pool resources (or occasionally referred to as CPRs) are the focal point of resource regulation and management*. Being both natural and manmade, the commons can bring an array of problems when ownership and rights are unclear. At its most foundational levels, a common pool resource is a public resource or material that is not owned by any person or institution in particular, and is intended to be accessed or appreciated by the public. Lack of regulation or unwarranted use and control of a CPR can lead to issues between the regulatory institutions and individuals. Because there are definitional boundaries of what or where a CPR is, fairly justifying its use (or its regulation) can be a difficult task. It is crucial that these nuances amongst a conversation on common pool resources and management are noted. As mentioned, definitional boundaries exist, but common pool resources can be anything. Land, minerals, water and space are all considered resources that are available to the masses, yet in need of regulation. Ostrom uses her research to outline the framework to managing any type of common pool resource, regardless of its specific qualities or uses. Another important distinction is what defines a resource or need as a “common pool” resource. The commonality of this term (and as referenced throughout this analysis) is the basic fact that it is something that is widely needed or desired. Farmers in a community might need plots of land that are naturally limited. The same is applied to individuals that desire quantities of water from a spring that has the risk of running dry. Common pool resources risk depletion and require a level of regulation or cooperation.

Individuals and parties in these situations that require a level of cooperation are forced to make decisions based on personal incentive and available resources. Ostrom’s research highlights three traditional decision making models that are commonly referenced when addressing the commons and their use. Ostrom also uses these models as a basis for her analysis.

* The following information based on research from Elinor Ostrom, as published in her book *Governing the Commons*

† The following information on the Bureau of Land Management was accessed online at

To better understand what motivates decisions and the use of common pool resources, it is necessary to briefly explain the models she references.

The “Tragedy of the Commons” is a frequently referenced model that accurately and dramatically shows the downfall of the over-use of a resource. Making decisions purely based off of personal outcome and immediate benefits drives the parties in a tragedy of the commons situation. These decisions are made from individual interests because there is no regulatory agency to facilitate cooperation that would cause otherwise. The primary illustration of the model shows what happens when there is too much taking of an open resource (i.e. water or land) and no regulation or replenishment. Individual players take what they desire, oftentimes with little regard to the effect of the resource as a whole. Communication and cooperation is nearly non-existent and overuse is prevalent. A lack of rules or limits to uses allows the individuals to misuse or overuse without the consequences of a managing institution, and the outcome is complete degradation or elimination of the original resource.

The second way to model commons problems is the famous “prisoner’s dilemma”. While typically seen as an economic decision-making model, the prisoners’ “dilemmas” help show how people or institutions react when faced with decisions that include both parties. Unlike the tragedy of the commons where individual is the only party acting at a time, the prisoners’ dilemma involves action based on personal incentive and speculation of multiple parties. Depending on the other person, the decision often changes to create the best possible outcome for the individual. A party understands their share and desired outcome, but also speculates about the others based on their own incentives. Oftentimes cooperation can be a gap-bridging tool that allows for fair outcomes to all. Modeling and experimentation, however, shows that personal incentive can be driven based off of speculation of the others wanting to cooperate. The

outcomes here are often unequal because of the dominant strategy it provides the party unwilling to partner. Ostrom relates this to common pool resources by showing how the relation of dominant strategy, assumption, and incentive are important when balancing decisions on common resources. In this decision making model, managing institutions can provide the regulations necessary to ensure cooperation and equal outcomes.

The final model outlined by Ostrom is the idea of collective action and the difference of decisions and outcomes when individuals are part of a group. The theory suggests that individual choices have little influence over the larger group direction, and therefore their actions do not always reflect the interests or direction of the group. Collectively participants know there is a right outcome, but the personal incentive is different. Problems arise when there is little regulation to guide these decisions. Group size and the resources at hand all have an impact on the outcomes of collective action. For the purposes of evaluating the effectiveness of management institutions, this model will be the least-addressed of the three Ostrom mentions.

Ostrom raises an interesting observation that all three of the decision making models and commons dilemmas can be applied to a multitude of scenarios, communities or subjects. They are a theoretical basis for deliberating choice making decisions on resource use in a group, territory or community. Additionally they provide a foundation for addressing the reasoning of policies and regulation, and help address the importance of proper management of a common pool resource. The questions initially posed by Ostrom on system regulation and interactions can be consistently routed back to the nature of one of these models. To further demonstrate the wide reach of these basic models, I will present a fictional scenario to show their application at the simplest levels. Here is a scenario for this consideration:

A small, rural village sits on a plot of land that has access to a limited amount of fresh ground water. A community well is drilled for the use of the residents, but no regulatory system is in place. Families A, B and C all have access to the water, and use it based on their own needs.

With the tragedy of the commons model, all three families have unregulated access to the water they need. Without policies or regulation on individual water use, the source is depleted and there is no more ground water. The prisoner's dilemma suggests each family makes its decision based on an assumption of what another family will do, which differs from the other approaches where individual incentive is the driving force. An unregulated prisoners dilemma scenario is about non-cooperative outcomes, so it can be demonstrated that working together and cooperating over the water access results in moderate, yet fair consumption of the water. The alternative gives one family a dominant strategy that ultimately results in unequal water use. The final model of collective action assumes that the families understand the best interests of the community as a whole, but individual interests drive the actual actions taken. While extremely simplified and basic, this example shows the basic premise of these three models of commons use and the problems that can arise when making decisions without regulation.

These simplified outcomes display what happens without regulation, however the significantly different outcomes that accompany a management institution are equally as important. The mechanics and assumptions of each of these models are distinctly different, and with regulation, their response is unique. Looking first at the tragedy of the commons model, it was noted that the resource use is unregulated and the depletion is uncontrolled. Each of the players assumes that the resource is theirs for the taking and that their relatively small consumption will not affect the large quantity of the resource available. The flaw in this thinking

and these assumptions, however, is that it does not account for the multiple other players thinking the same thing. When multiple people in a community or ranchers on a plot of land use for their own benefit without regard to others doing the same, the use of the resource is exponentially more. It results in the depletion in a much shorter time than intended.

The specific mechanics of the prisoner's dilemma are similar, however the possibility of the resource being completely used in the short run is less daunting. The assumptions drawn by players in the prisoner's dilemma are not directed towards the resource itself, but rather the actions of the other players. An important and significant difference between these two models is in this subtle detail. The tragedy of the commons players make assumptions and decisions based on the quantity and availability of the *resource*, with little regard to the others, whereas the players in the prisoner's dilemma make assumptions about the *decisions of the others*, in order to maximize their outcome. When two families in the hypothetical are vying for access to the water, their decisions and outcomes are interdependent on each other, they attempt to know what the other family will do. If the two families do not cooperate and attempt to take as much possible for their personal use, then their access time will overlap and neither family will have adequate time. If one family is willing to cooperate on access time, but the other assumes this and requests more, the second family has the dominant strategy and best possible outcome for themselves. The outcome results in unequal access time, and no cooperation. The third outcome is cooperating on access time and allowing each to take less. While there is more to be had if a family had a dominant strategy or total access, the results after cooperating are far more equal.

These examples show the different outcomes of these two decision making models if there were no regulation, but what would the affect of regulation make over the decisions and outcomes of these same models? The regulation of shared resources does not look the same in

every situation. Later in this research and analysis I will explain and apply a real-world example of a land managing institution and some of the challenges it faces with regulation. For these hypothetical examples, however, I will briefly demonstrate the differences in outcomes if the resource in question had some level of supervision and regulation. Returning to the ground water example, the regulation is now in the form of a water authority that controls the family access to the ground water. Families would now have limited access that would allow them adequate water to support their needs, but not unregulated access to support everything they desire. The tragedy of the commons relies on the families acting in their own best interests with no attention to the other players. In this case, a water authority would bring heightened awareness to the possibility of depletion, and the families would essentially be forced to acknowledge that complete access and control is unreasonable.

In the prisoner's dilemma the managing institution (water authority) acts as the facilitator for cooperation. There is no need for the families to make assumptions on the other players' decisions. Instead, the water authority has the ability to communicate between the parties and create a schedule that would allow each family equal access to the water, without any dominant strategies. Though the outcome is less access time per family, the regulation serves as a communication tool to show the resulting equality.

Aside from the decision-making aspect of use and misuse issues from common pool resources, Ostrom explores the policy models that can be used as regulatory tools to accompany a resource. It is important to look at these two policy models as broad spectrums in which we can generalize a policy or act by- not restricting compartments that every regulation will fall completely in line with. *Leviathan* is a theory of centralized control. It categorizes policies that rely on a central management system to oversee resources, individuals' use and their

preservation or conservation. Governments, boards, commissions and regulatory councils are all examples of agents within a leviathan policy model. A leviathan policy is not one of *complete* government control, but rather one that relies on some system of management to keep workings in check. The second policy model is privatization, and relies on property rights amongst individuals. Though it has less regulation than a leviathan model, it still requires some government to ensure the enforcement of contracts. Property rights and the use of contracts are the means of control and regulation.

Returning to the same hypothetical example that guided the decision making models, I will briefly demonstrate the different role a regulatory agency would play in both a leviathan policy model and privatization model. Policy and regulation within a leviathan model would incorporate a substantial amount of centralized control. Not only would the water authority be the institution that directly oversees the resource and its use, the authority's power would allow them to have control over its access and the amount of water used. Leviathan policy uses regulatory tools such as permits, metering or specified allocation to exhibit this centralized control. In our water example, the authority would issue water rights permits to the families that wish to access the water. Each family would then be allocated a specified amount of water per month, which would depend on the family's needs, or set as an equal level to all. The benefits of leviathan policies are the consistency of enforcement, and equality in the access, however the centralized control that the authority would have has the potential to raise questions and concerns over the power of the central institution.

For the purpose of this research, and as outlined in Ostrom's work, the alternative to leviathan policy is a model of privatization. The first thing to understand with privatization is that despite its name, this is not a model free of regulation or government. Private policy models

incorporate the use of a central authority, but the institution's control is less comprehensive and authoritative. The primary role of a government or regulating institution in a private model is to enforce contracts made between the parties in a situation. Privatization can be applied through the hypothetical scenario on water access to see how it would work in a real setting, and what kinds of policies would be at hand. Instead of the water authority issuing permits and monitoring access, the families would be given the means to create and sign their own contracts regarding their use of the source. Limitations to use, the amount able to be accessed, and even access times could all be covered in a private contract between a set number of parties. The contract would be filed with the water authority and its terms monitored. In the case of a contract violation, the water authority would still be granted the means to enforce it properly, whether it is in the form of fines or loss of contract rights.

Choosing regulation methods and debating policy models is not an issue that is isolated to land rights or common pool resource problems. These types of questions regarding private versus leviathan, and the appropriate amount of control are debated on daily in government systems (local, state and federal) in the United States. Later in the analysis I will draw upon the Bureau of Land Management and a specific land rights case they have been faced with to better relate these policy models and enforcement methods to an actual example. An outcome to recognize now is that with both of the policy modes stated, a level of cooperation is instilled and resource depletion is not an issue. The tragedy of the commons and prisoner's dilemma demonstrate how no authority or managing institution leads to flawed outcomes. The facilitation of communication and ability to enforce regulations and contracts is the primary objective of the centralized institution, which is successful in not allowing unregulated access or use.

In summary, both suggest the control of common pool resource problems through their own strategy. Under leviathan policies the central control is the head regulator that oversees the resource via a management system. Strict adherence to the rules and regulations are expected, which minimizes abuse and encourages fair use and distribution. Privatization should not be seen as a polar opposite, as it also suggests that the policies will reduce resource depletion. It is also interesting to note the observation that common resources would not be commonly accessed under privatization. Individual ownership rights would be granted and the owners will have the luxury of using their resources how they want. These approaches are assumed accurate provided people act in their own best interests and do not attempt cooperation without regulation. Both the decision making models and the policy outlines rely on the parties using more than is deemed adequate, and without consideration to the well being of the resource at hand or the other parties involved. Both the tragedy of commons and prisoner's dilemma are rooted in motivation for betting the self, and the policy models show a need for some kind of centralized control. These assumptions are drawn from observation and careful consideration of how people act in particular situations, but also disregard the potential for preservation or regulatory efforts on their own. In some regards the policy models are a safety net that is prepared to facilitate cooperation and oversee action if needed, but is not a complete necessity if the assumptions about the situation are false. There are tradeoffs to be considered in all this, as well. By assuming practices that will only better the individual party, a policy and regulation is needed. By instating an authority, however, there possibility of too much control or unnecessary policies and procedures. The outcomes of overregulation are varied, but can be as harmless as easing access rights back to the individuals, or severe as public unrest and noncompliance. The alternative is regulation that is inadequate to do what it is intended to do. Whether it too lax or not authoritative enough, a

situation with little centralized control runs the risk of no cooperation and individual prioritization. Risk and reward is a theme in any balancing of choices. Through the lens of the Bureau of Land Management, we will see how these policies actually work in practice, as well as look at a real scenario the BLM is facing right now. In turn, these two policy models will be continually referenced throughout the paper and the applied example as two general systems a regulation or act can be categorized under.

Looking at the basic categories of policy models and the three decision making models raises important questions to address prior to evaluating specific examples. The first question I'll pose is *what types of rules regulate systems?* After seeing the dilemmas that various decision-making models can cause, the question of rules and regulation is an important one. The central theme behind common pool resources is the evaluation of what can be used, who can use it, and at what cost it is to use a public resource. It has been determined (and acknowledged in both policy models) that a central management system of some sort is necessary. What are these types of systems, and what kind of regulatory power do they have? Boards, commissions, governments and councils have already been established as common means to provide guidance. Later in our analysis we will look at specific means and documents via the Bureau of Land Management as an applied example of a regulatory system.

A second question to keep in consideration while evaluating these common pool resource issues is *what types of interactions result from regulation and policy enforcement?* As noted in the evaluation of decision-making models, not all parties will realize their preferred outcome. It is the nature of making decisions that gives reason for a model like the prisoner's dilemma, which shows parties' actions depending on strategy dominance. With common pool resource issues, strategy dominance is often accessing or using as much or more of a common resource

than is actually necessary. When I addressed the prisoner's dilemma through the water access scenario, the dominant strategy that each family wanted was based on making decisions that would increase their access time in comparison to the other family. With regulation and cooperation, the need to attain dominant strategy is not necessary because of the equal disbursement the managing institution provides.

As has been referenced multiple times, common pool resources and parties' use of these resources results in interactions between the individual players and the managing institutions. The systems that regulate these resources rely on communication and clarity to help form overall effectiveness and efficiency. The interaction that occurs between the parties of common pool resource enforcement can be one of two primary extremes. The first (and preferred) is compliance and understanding. Management systems set the rules, the individuals or institutions comply, and all sides understand. The alternative is non-compliance. This is not necessarily an outright refusal to follow the rules or regulations set. It can be the misunderstanding, lack of understanding or non-commitment to the rules in place. A non-compliant outcome can go one of two ways as well. The first is the eventual understanding and acceptance from one of the parties, ultimately resulting in eventual compliance. The other outcome is the refusal of acceptance or continued and intentional non-compliance. Though it is never preferred, this reaction can lead to public outcry, attempts at exposition or even violent retribution. Regulations must be strong enough to settle conflict while still anticipating the possibilities of non-compliant actions.

The third question to consider while evaluating systems and looking at examples of common pool resource issues is *how do these systems work in practice?* Regardless of the policy model, managing institution/system, or severity of the issue, it is crucial to understand the importance of common pool resource management. Answering this question can directly affect

how we handle common pool resource problems and influence our methods of conflict resolution. Knowing the importance of how these systems work can even be reflected through future policies or regulations- all of which is important to effective and efficient CPR management.

In order to better understand current methods of management I will use the United States Bureau of Land Management as an applied example of a common pool resources management institution. After a brief history and overview of the BLM, I will address certain policies and regulations it has as a managing institution. Further, the BLM operations and methods will be used as a demonstration of Ostrom's concepts of policy models and decision-making models. I have chosen to use the Bureau of Land Management to demonstrate the regulation and enforcement of common pool resources issues because of its oversight of public lands in the United States and its established policies[†]. The BLM is a system that regulates public lands- one of the most sought after resources. Because of the value that public lands have for grazing and usage, it is necessary that clear and effective policies are in place to ensure cooperation and compliance. The BLM operates substantially within the realms of the Federal Land Policy and Management Act, which lays a foundation for all its operations. More on the FLPMA will be addressed later. Additionally, viewing common pool resource issues and enforcement through the BLM allows Ostrom's theoretical foundation and examples to be applied to an actual institution.

The Bureau of Land Management is an agency of the federal government within the Department of Interior. The BLM's history dates back to the early 1800s as operations and duties within the General Land Office (GLO), though it was not officially named a bureau until 1946. At this time, the General Land Office and U.S. Grazing Service combined to create a larger

[†] The following information on the Bureau of Land Management was accessed online at www.blm.gov

agency capable of addressing the large responsibility of public land management in the United States.

The Bureau of Land Management mission was created and activated in the 1976 Federal Land Policy and Management Act (FLPMA). The mission of the BLM is to “sustain the health, diversity, and productivity of America’s public lands for the use and enjoyment of present and future generations”. With an annual operating budget in excess of \$1 billion and more than 10,000 full-time employees, the Bureau of Land Management has clearly outlined priorities and has a distinct duty within the federal government. BLM land is primarily in the Western states; however the public lands they manage is over 245 million surface acres, all across the country.

The Federal Land Policy and Management Act of 1976 holds the primary operating procedures for the BLM[‡]. With so much land and employees to be overseen, it is important that managing policies, regulations and procedures are kept fair and consistent. BLM’s semi-informal beginnings have proven to create an interesting scenario when looking at the ownership rights of some common pool resources. This is especially true for family lands and inheritances that have spanned over multiple generations. A more in-depth analysis of some of the problems that have risen with the BLM structure and procedure will be addressed later through an applied example of a land dispute.

At nearly 60 pages in length and seven sections long, the Federal Land Policy and Management Act is the federal law that dictates the operations of the Bureau of Land Management. It is necessary to highlight selected sections of the FLPMA before analyzing the BLM management and policy structure in comparison to Ostrom’s work. It is important to note that the Federal Land Policy and Management Act is a lengthy document that addresses the

[‡] The Federal Land Policy and Management Act of 1976 can be accessed online at www.blm.gov

operations of the BLM very comprehensively. Many sections, regulations and details have been omitted from this overview so only selected relevant connections are addressed.

The Federal Land Policy and Management Act includes sections on the rules and regulations of public land use, who is entitled to its use, the authority that oversees it, and the relations between parties involved. The first section worth addressing falls under the second title and deals directly with land classification and trespassing. Trespass in the BLM sense is in regards to the land use and acquisition, not necessarily individual trespass. The third title of the FLPMA is specifically rules and authority. It is interesting to note the level of authority that the Secretary of Interior is granted when it comes to BLM-related issues and conflicts. In general, the full power of the law may be used to support the rules BLM issues, and the Secretary has a fair amount of discretion if needed.

The Bureau of Land Management is a federal entity with close relations to state governments and local authorities, all of which have some level of enforcement authority over public lands and their jurisdictions. The FLPMA helps ease divisions between these agencies and in part aims to clarify the operations and protocol when managing public lands and resources that fall between two or more agencies.

The fourth title of the FLPMA addresses grazing permits and leasing specifically. As published by the Bureau of Land Management, nearly 155 million of the 245 million acres that the agency oversees are public lands that allow grazing. The BLM has specific systems and methods that address grazing in order to allow activity on the land without depleting resources or damaging the land because of overuse. Permits and leases are granted to farmers or ranchers that choose to graze their livestock on these public lands. Annually nearly 18,000 leases and permits

are issued to those that graze their livestock. The permits typically last for an extended amount of time (up to 10 years) before they are up for renewal or reevaluation.

Public grazing lands were less regulated in the early 1900s, which led to overgrazing and unintentional damages. The Taylor Grazing Act of 1934 was enacted to help introduce more regulation that would protect the lands while still allowing ranchers and farmers graze the public lands. Districts were organized for grazing use and eventually a full U.S. Grazing Service was developed to manage the grazing. Within 15 years the USGS merged with the General Land Office to become the Bureau of Land Management, which in turn took on similar responsibilities with grazing regulation. Today the BLM aims to have land health and protection at the forefront of their goals with grazing on public lands. Permits and leases are still issued, but are done so in a manner that allows for preservation and appropriate use.

In review, here are the four sections of the FLPMA that will be further analyzed and applied when looking at Ostrom's concepts, their relation to the BLM as a managing system, and their effectiveness in actual practice:

Unintentional Trespass Act - Title II, Section 215: This section of the Unintentional Trespass Act grants authority to the Secretary of the Interior to “revoke, modify or terminate in whole or in part, withdrawals or classifications” in regards to land acquisition and the exchange of lands. Authority can only be exercised in specific cases where an exchange meets outlined criteria.

Enforcement Authority – Title III, Section 303: The Secretary is granted authority to lawfully pursue individuals who willingly and knowingly violate regulations within the FLPMA. Minimum fines, court requirements and additional penalties are within Secretarial authority. The section continues to say that cooperation with any “state or

political subdivision” law enforcement or regulatory agency is required on matters when activity is cross-jurisdictional.

Rules and Regulations – Title III, Section 310: States that the Secretary shall publicize and disperse the rules and regulations necessary to carry out the actions that the FLPMA calls for.

Title IV of the FLPMA outlines the policies and procedures of Range Management and specifically addresses sections of the Taylor Grazing Act of 1934 which provides regulation for grazing permits and leases in federally managed lands. It specifies everything from permit pricing and length to lease enforcement.

Grazing Leases and Permits – Title IV, Section 402: The Secretary is granted privileges when necessary to “cancel, suspend or modify a grazing permit or lease”. If there are allotment planning or management issues that come up, the Secretary must coordinate and cooperate with the lessees and landowners involved, however the Secretary has the right to reevaluate the land and allotments in question. Additionally it states that grazing limits and livestock count can be reduced if found that the land in question is being diminished or deteriorated – adjustments requested must be completed by the landowners or permit holders. The section concludes by saying that nothing mentioned should be construed with respect to the “right, title, interest or estate in or to public lands”.

Additionally, FLPMA addresses Department of Interior and BLM authority to Rights of Way through public lands for public works or management. Note also that while a sufficient overview is provided for selected sections, specific rules and policies for the issuing and enforcement of these policies is outlined within the FLPMA. The Act itself leaves nothing unquestioned or

unclear when it comes to pricing, length, authority or rights in regards to public land management and the relation to landowners, lessees or other agencies.

As a part of the Department of Interior, the BLM has the enforcement mechanisms and regulation in place to manage public lands, but how do their policies and practices align with Ostrom's theories and observations with common pool resources management? Additionally, does the BLM face the same dilemmas or issues that Ostrom recognizes as fairly inevitable within public resource management?

The core of Ostrom's concepts comes from the methodology of land management, and the decision making behind regulatory systems and the outcomes or results that ensue. Governments and institutions are created in part to address common pool resource problems, so the BLM can be used as a model land management system, and its alignment to Ostrom's policies can be used as a base for evaluating effectiveness and efficiency.

As outlined by Ostrom, management as a central authority over systems and resources illustrates a leviathan policy model. It is not necessarily a belief or action in complete governmental control, but rather recognition for a need in some sort of institution or fathering system that oversees the interactions and serves regulatory functions if needed. As stated in *Governing the Commons*, Ostrom explains that the presumed role of a leviathan policy model is to thwart the potential for tragedies of the commons and to grant central governments some sort of centralized control. Just through its basic conception and roles, it can be fairly easily concluded that the Bureau of Land Management is a leviathan institution (theoretically) when it comes to management and control. Complete private control without a managing institution at its core (regardless of the actual powers granted) would lead to overuse or misuse of the lands thereafter deemed as public when the BLM was created. The government does not have total

control, yet *something* is required of the government as a managing institution for adequate maintenance and oversight.

Enforcement authority and the grazing leases and permits are prime examples of leviathan theory and policy within the BLM. Not only does the enforcement authority granted to the Secretary by the Act authorize action to be taken if needed, it encourages (to an extent) compliance and cooperation with a central institution. Penalties, fines and restrictions are some of the systemic mechanisms used by the BLM to ensure compliance, and specific mention of non-compliance is made to help outline why coordination and cooperation is so necessary.

The tragedy of the commons was previously mentioned as one of the decision-making dilemmas that is also avoided by having a managing institution for common pool resource issues. Additionally it can elaborate that in these instances, the “commons” that are misused and fought over in the tragedy of the commons are public lands or grazing areas. Without the control and regulation, the interested parties (primarily landowners in a specific area) have no incentive *not* to fight for the abundance of resources or land that they want. The Bureau of Land Management works to ensure that land is not only prevented from misuse, but that in the case it is being overused or deteriorated, it is being protected or replenished. The principle behind the tragedy of the commons undermines the mission of the BLM, and is essentially directly addressed by the FLPMA.

Further, the BLM and the managing Act reflect Ostrom’s analysis and observation of collective action logic. In an unmanaged system, personal interest (disregarding what is “known” to be right) overrides the preferred actions and outcome by a group. When the freedom to make preferred decisions is widely recognized, problem arises. If regulation is non-existent, there is nothing there to guide the decisions of the individual parties. The Bureau of Land Management

addresses collective action logic in the “real world” as an all-seeing, yet non-coercive, system to ensure that the decisions by the individual parties are made with the understanding that there are consequences or penalties to making decisions that would be unfavorable to lands or resources deemed “public”.

Through these policy and decision-making models we can see that the Bureau of Land Management addresses general problems and mission objectives through a lens of public management as stated by Elinor Ostrom. Her observations are credible through her research and affirmed as valid seeing that institutions have these theories in mind. Whether it is intentional or not, how practical and effective are these policies in practice? Does a generally-leviathan model help limit the potential for overuse? Do BLM policies and does the Department of Justice authority address temptations that lead to the tragedy of the commons? And does having a central enforcement authority minimize collective action logic, or do individual parties still make decisions based on personal incentive, regardless of the public good? The BLM exhibits the guiding principles that Ostrom has used in her research, but their effectiveness is what needs to be looked at and evaluated further.

We have seen that the Bureau of Land Management is an actual managing institution that applies similar foundational concepts in their daily operations. The BLM works to alleviate the pressure of individual choice on resource-use, and uses the general outline of these decision-making models to guide their policies and regulations. There is a clear connection between the problems and theories Ostrom has addressed, to the objectives and mission of the BLM. The Federal Land Policy and Management Act is a central document that not only steers much of the work of the BLM, but also helps bridge the gap between CPR problems and adequate solutions. The connections may be fairly clear in writing and theory, but for the purposes of observation

and analysis we will apply the operations of the BLM to an ongoing situational example from the state of Nevada. The questions previously posed of BLM institutional effectiveness - actual authority and decisions amongst individual incentive - will all be addressed through this applied example of these systemic policies and regulations in practice.

The case of the cattle rancher, Cliven Bundy, and his relationship with the BLM has been popularized on the Internet and through news sources in recent years[§]. Cliven Bundy's negligence to work with the BLM has culminated into a media-proclaimed "standoff" between the various governments and agencies and the rancher himself, amongst supporters of his liberty and defiance. Media and coverage aside, one cattle rancher's decision to make individual choices based on personal incentive has proven to be a challenge for BLM enforcement, specifically in regards to public land cattle grazing and trespassing. While the various facts and components of the case date back for nearly a century, 2014 marked the year where the Cliven Bundy case was noticed in the national news cycle. By looking at the facts of this case, understanding the positions of the parties involved and looking at the results through 2015, we can have a better understanding of the BLM practices applied and the incorporation of Ostrom's theories in real-life.

The Cliven Bundy family has claimed to have ranched in the Bunkerville, NV area since its establishment in 1877. According to Bundy, his family has had "preemptive, adjudicated livestock water rights" with the state of Nevada since the original pioneers settled in the Bunkerville valley. Inheritance since the late-19th century has led to the land being acquired by Bundy in the mid-20th century. A central aspect of the Bundy case has been the legalities and legitimacy of the land owned by Bundy, and when the legal acquiring took place. Since the early

[§] The following information on the Cliven Bundy case has been adapted from various news sources and compiled at www.washingtonpost.com

1900s, Clark County and local census records have showed a gradual assembling of Bundy's in the area, as well as a progression of development on the land and in ranching. The Clark County Recorder documents have been reported to show the Bunkerville ranch where Bundy is currently at to have been settled and purchased in 1948. His father, David Bundy, used the 160-acre ranch for cattle and livestock for years after Cliven's birth in 1946. The rural open land that the Bundy ranch is on has been jointly owned by Cliven Bundy trusts since 1994.

As originally stated in the Taylor Grazing Act of 1934, and updated into current policy through the FLPMA, are the rules and policies associated with open grazing in public lands. Permits and leases for cattle to use the grazing lands are necessary per law. In 1998 a U.S. District Judge determined that the land was federally owned and managed, and that the Bundy ranch would not be able to continue grazing in the area. The contention with the law dates back to the 1950s when the family started grazing the livestock on the public lands controlled by the BLM.

The original motive for the heightened protection of the land Bundy ranched on came from growing concern of the endangered desert tortoise, which is found naturally in the southern Nevada environment. March 1993 marked the year when livestock grazing became stricter and grazing opportunities were starting to become more limited. These new rules and the limitations on grazing permits were when Bundy stopped paying the fines that had accumulated. The increasing fines led to the revocation of Bundy's grazing permit, in which he responded by not applying for a new one, while still grazing the lands. The Washington Post reports that by 1995 ranchers were starting to have increased troubles with the BLM restrictions and enforcement over federal land use. The troubles culminated in some physical violence, including a small bomb detonation in the Carson City, NV U.S. Forest Service Office and heightened concerns

over BLM and federal agency employee safety. By this time, the unpaid fines towards Cliven Bundy for the unpermitted grazing had reached nearly \$31,000.

The root of Bundy's entitlement to the land was self-reported to have come from his ancestors who had originally acquired and used the lands in the 1800s. Given the grazing authority for the federal government was not officially enacted until 1934, and the BLM after that, Bundy's central argument has been that of federal encroachment and the limitation of rights to land he has the privilege and entitlement to. Court action continued into the late 1990s when Bundy represented himself in front of the 9th Circuit Court of Appeals. In 1998 the federal judge over the San Francisco court ordered that Bundy's cattle that had been grazing the lands be removed from the area.

The BLM warnings and postings of off-limits grazing continued for over a decade while Bundy still ranched his cattle on the open lands. As reported, local ranchers disagreed with the policies and revocation of rights. The rules were blatantly not followed and cattle still inhabited the public lands. In April 2012 a federal court complaint was filed in Las Vegas, NV that was directed towards Bundy and his unlawful and unpermitted grazing. Just prior to the legal action being taken by the federal government a plan was proposed by the BLM to do a round up of the cattle on the land. Threats and excessive complaints led to the plan being called off. To add to the mixture of events and media attention, Nevada Governor Brian Sandoval requested that the director of the Nevada Department of Wildlife, Kenneth Mayer, resign because of the complaints from the local cattle ranchers displeased with his determination to preserve the land and limit grazing.

In August 2013 a court order was issued to Bundy notifying him of a 45-day period in which he would have to remove his grazing cattle and livestock from the federal lands. After

Bundy did not comply, a federal district judge followed up by ordering Bundy not to interfere with any operation that could be taken towards him. This referred to physical round ups or impoundment of his grazing livestock. Just six months later in March of the following year, the BLM issued a final letter notifying Bundy that a plan had been made to impound the cattle in question that were still grazing the federal lands. This issue and plan in March 2014 was nearly 20 years after the initial interactions between the BLM and Bundy started.

After the BLM plan to impound the cattle was released, the following weeks consisted of the gathering of a small militia in support of Bundy and his use of the land. Bundy and his supporters still held the belief that he was entitled to the use and management of the land in which his cattle had grazed, and that interference by the federal government was not only unjust, but illegal. The action from the federal government led to increased public attention towards Bundy and the incident in Bunkerville. By April 2014 the BLM started the round up operation of the grazing cattle, which reportedly was going to cost nearly \$1 million, all of which (in addition to the previously accumulated feeds) were to be paid for at Bundy's expense.

The altercations between Bundy's supporters and the federal government did not end as the round up operation began. Multiple family members of Bundy were injured during confrontations with federal government agencies and officials, and the unofficial militia of supporters that was forming in Bunkerville was creating tension between the parties involved. It is important to note that through the public attention and media coverage, the "battle" being fought is thought to have transgressed from a grazing and common pool resource management issue to a constitutional rights issue. Because of the heightened attention and redirection of focus, the BLM announced in mid-April 2014 that the court order to round up the cattle would not be enforced because of the ground conditions and fear of the safety for the public participants and

the BLM employees. Bundy supporters took cancellation as a sign of victory, although the BLM was public in saying that the government was not tolerating the unlawfulness, just working on a new way to move forward with a successful operation.

The ongoing events in Bunkerville with the Cliven Bundy family and grazing cattle is an excellent example of the reported misuse of public lands, and serves as a good account to analyze the actions taken by a land management system in a real-world setting. Despite the media coverage that increased the attention of the Bundy case, at its roots Bundy's actions allows us to look at how an actual resource management system works, and what actions lead to what outcomes. In this case there is a conscious non-compliance with the law, and the BLM is forced to make the decisions that are believed to be best and fairest for the parties involved, while still maintaining their focus on the protection of the land in question. It leads us to questions such as how do the concepts Ostrom introduces actual work or not work in a real-world setting, and how do management systems and theories work in practice? The Bundy case as outlined gives a quick overview to the facts of the situation, and allows for us to further address these questions.

The first thing to look at when analyzing the Bundy case and BLM interactions is to determine what is actually happening at the situation's roots. Media and militia aside, Cliven Bundy was determined by the BLM and various courts to be a non-compliant grazer that actively ignored the policies and regulations set by a governing institution. The BLM in this instance is the primary overseer of the management of the property because it is federal lands. Bundy's issue with the regulations stems from his belief that the lands are his based on his familial ties and ownership in the past. The BLM in this scenario is primarily concerned with this misuse and overgrazing of a property that could eventually lead to the deterioration and elimination of other species of plants and animals.

While it could be argued as an example of any decision making model, for this analysis I will relate the foundation and core actions and principles of the Bundy case as a representation of the tragedy of the commons. The BLM acted in a way representative of the fears to be had with overgrazing. Bundy used the land at his own will, with disregard to the possible effects that could be had otherwise. The tragedy of the commons shows what happens when too many or too much is taken from a public resource. When no regulations are set, or policies are not followed, the public resource is diminished and ultimately ruined. The BLM has implemented a system of permits and leases to help control use of public lands. When looking at public lands and management this is the core of their regulation and control. Specifically with lands and grazing, the permit issuing is formulated in a way that will allow for public use while still protecting at a rate that will not lead to overuse. Even with the system in place, Cliven Bundy continued to use the land at his own rate without complying with the regulations as set by the federal government.

In the Bundy example, cooperation with the BLM policies was not had. Looking at the situation as a whole, had Bundy cooperated with the regulations and followed the permit rules, the land would have theoretically been protected and no situation would have developed of it. By looking at the events that ensued, it is clear that alternative action had to be taken in order to find a solution that resulted in their desired outcomes. How was this common pool resource issue handled? The BLM resorted to a leviathan policy model that had actions and procedures outlined in the Federal Land Policy and Management Act. The BLM was authorized to take the actions necessary to ensure the wellbeing of the public lands and the compliance of their policies.

The actions taken by the BLM in response to Bundy's non-compliance were clear and simple – there was little tolerance for the unlawful grazing and legal, court-ordered action would be taken to ensure that the grazing stopped and that Bundy was adequately fined for the potential

damages and misuse done. Realizing that notices and fines were not enough, physical intervention was the eventual step that the BLM chose to move forward with. These moves towards impoundment of the cattle and livestock roundups are what caused the anger and physical confrontation between the federal government and Bundy supporters. This also happened to be the catalyst for media attention, which can be assumed, was not an intended outcome the BLM expected. It raises a follow-up question of what role public perception and attention plays in the decision making of common pool resources management systems. Had the public been unaware of the Bundy situation happening in Bunkerville, would their actions been the same I argue that the BLM acted in a way consistent of their management principles, and unaffected by the heightened attention. Per the FLPMA regulations and policies, the BLM worked direction with Bundy, and continued with their outlined plans for cattle impoundment. If less or no media attention were present, their actions would have been the same. The unforeseen variable in this situation that did play a significant role came with the gathering of supporters that had no direct connection to the situation at hand. This self-proclaimed “militia” that formed in Bunkerville redirected the focus of the Bundy case from one of overgrazing and noncompliance to a question of first amendment rights. Because of this, the safety of all parties involved (BLM and non-BLM affiliated) was called to question, and the ultimate action of cattle impoundment was called off to ensure that physical altercations did not escalate.

Additionally I simply ask, did the BLM policies, regulations, and actions taken work? The Bundy case is ongoing and no actual outcome has been determined yet, however the consistency and clarity that the BLM had in their policies and decisions shows that there was a plan and outline in place, and they followed it as directed. Land management and managing institutions do not need to have their ideal outcomes achieved to be successful in their work. In

this case of Cliven Bundy's overgrazing, the BLM identified the problem in adequate time, and continually took the measures needed to stop the misuse and appropriately sanction the violator in question. Ultimately, the BLM showed that a governing document can be enough to outline rules and procedures for addressing common pool resource issues, regardless of what variables are at hand. As the Bundy case continues to unfold in the coming months or years, I project that the mission of the BLM will stay at the forefront of their focus, and that the FLPMA will continue to guide the actions taken.

With confidence through adequate evidence, it can also be stated that Ostrom's guiding principles and core outline for public management systems is not only accurate, but important to understanding how an institution would act and what issues could arise. The decision making models and issues that come with common pool resources are adequate and accurate portrayals of actual events in public resource use. As previously stated, the Bundy grazing displays the decisions made in a situation similar to the tragedy of the commons. Managing systems and agencies, such as the BLM, are forced to react in a way that keeps their mission at the forefront, and a clear goal in mind. With the Bundy case, the BLM embraces the differences and benefits of both policy models Ostrom refers to. The leviathan model is clearly seen here in the fact that the government is not completely controlling, but a central structure and some government influence is needed or else it would result in free for all. The BLM specifically outlines why and how they will enforce public lands use issues, and in so doing, it protects the lands and the public from the unrestricted use by users such as Bundy. If the model was not seen as leviathan, Bundy would have the private rights to his land, and federal influence or control would be minimal. While the outcome of that cannot be completely certain, it can be assumed that the land would deteriorate and its protection would not be there. From this it can be confidently determined that

Ostrom's theoretical framework for common pool resources is a true foundation for how actual managing institutions interact and react with issues that arise.

Learning about and analyzing the Cliven Bundy case in Bunkerville, Nevada also allows us to look at trespass and grazing issues that lead to confrontation in further depth. While this is just a single example, the Bureau of Land Management addresses noncompliance with its policies and regulations often. I have determined that confrontation and escalation that characterizes the Bundy case is an isolated situation, but it is necessary to review the policies and enforcement procedures that the BLM has and ask if their methods are the best for a large land managing institution. The BLM relies on cooperation and communication to ensure that its regulations are followed. Through looking at the BLM response and action in the Bundy case, I argue that the procedures and actions taken were appropriate, and that the BLM regulations are sufficient to address typical noncompliance issues. The trespassing that ensues after not purchasing or renewing a grazing permit or lease is an issue easily addressed through the FLPMA policies. Institutionally, I argue that the response to the publicly noncompliant situations needs to be refined. The Bundy case had attention brought to it because of the amount of publicity and popularity that was raised with the media attention. While that is unrelated to the primary issues at hand, what is important to address is the time from when the situation initially started, and when the BLM began to take action. The role of a managing authority like the BLM is to address issues in a timely manner to ensure that it does not escalate or happen again. With the Bundy case, the original permit was revoked in 1993 and the grazing fines were not paid for over 20 years. This extended time span was what ultimately led to the confrontations in 2014.

The managing authority in any common pool resources regulation situation is the central enforcer for cooperation. Without the enforcement, it is as if no authority is present. Applying

this to Ostrom's concepts, in the Bundy situation, the BLM essentially allowed a tragedy of the commons scenario to take place. While initially looking at the tragedy of the commons, the water authority in the ground water access example was the central figure that regulated the land. Without the regulation, the water was overused and accessed freely. The same is true when applied to the Bundy case. While action as continually take, the BLM failed to remove the cattle or physically facilitate cooperation with the rancher, creating a situation that resulted in overuse of the public lands. As per the original reason for protecting the lands, the depletion of the resources was endangering to the environment and its protected species.

Addressing these types of regulations and interactions is important, not only to the functionality and success of the Bureau of Land Management, but for the facilitation of cooperation between individuals and governments. BLM policies are in place in order to ensure the protection and maintenance of public lands. Additionally, the BLM is often a direct source of contact to the federal government for many people. With functional operations and sound policies, the BLM is able to successfully facilitate that cooperation and communication that is necessary. Issues like the ones addressed here are extremely important for analyzing the effectiveness of the management, and also the interaction the government has with individuals. These conversations and critical analysis are also important for determining best practices when faced with common pool resource management issues. Ostrom's foundation for decision making was primarily characterized through the tragedy of the commons and the prisoners dilemma – both very real and serious situations that the cooperation of a central authority can aid in thwarting.

The relation between the BLM and the Bundy case also sheds light on the leviathan policy model. Strong centralized control that enforces regulation while still allowing freedoms is

critical for the compliance and effectiveness of a large common pool resource management institution. A policy approach that is leviathan in nature is necessary. The Bundy case is an accumulation of noncompliant actions that has eventually evolved into a larger issue, past the original goal of preserving the land. With as much land and as many individual parties the BLM works with in its operations, strictly adhering to just contract enforcement or permit issuance is not enough. It is necessary to establish policy and methods of enforcement to ensure that situations are dealt with adequately, and that the mission of the BLM can be carried out effectively.

With this all in consideration, lessons can be learned from the Bundy case. The BLM is a strong and effective common pool resource management institution, but active policy enforcement must be a priority. The concepts introduced in Elinor Ostrom's research are an accurate and adequate framework for common pool resource issues. Namely, the tragedy of the commons and prisoners dilemma are not only realistic outcomes when there is a lack of central authority, they are also the foundation for individual action when the management system fails to enforce firmly. Ostrom's theoretical foundation also addresses two distinct policy models that managing systems can adopt. While they are certainly not the only models in the realm of policy development, a leviathan approach or private approach are the two addressed. I argue that both are able to allow a central governing authority to follow its mission, however when large-scale management of a public resource is at stake, contract enforcement of a private policy model is not enough. In my opinion, had the BLM operated under a privatization policy model, the Bundy outcome would have been similar and different in various respects. The difference is that the Bundy estate would have had more ownership rights and ability to manage their property without the oversight of the BLM and their mission to protect the lands. The BLM would have

been the primary enforcer of contracts between the Bundy ranch and others, which could have introduced similar issues. Seeing Bundy's actions following the BLM notice of removal, I do not believe he would have been compliant in either situation. It is important to learn from and understand these cases for this reason. Compliance and mutual understanding is necessary, regardless of what policy model is in effect. We care about the differences in these models to better understand institutional response. The BLM operates under a predominantly-leviathan model, and as seen in the Bundy case, the enforcement is not always enough for the situations or confrontations that can arise. No approach should be preferred, especially for common pool resource management. It is necessary that the central institution evaluates their own needs and mission to best develop an approach to managing the resources that will benefit both the agency and the public users.

Although the Bundy case is still ongoing, the actions and policies of the Bureau of Land Management have allowed me to take a deeper look at the institutional theories around common pool resource issues and individual decision making. The BLM will continue to follow its mission of sustaining the "health, diversity, and productivity of America's public lands", while striving to maintain good relationships with the individuals that use the public lands. Ostrom's framework leaves us with a solid foundation to work from, and the decision making methods and policy models that characterize common pool resource management will continue to help explain the actions and outcomes that follow.

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