CHALLENGES TO U.S. PARTICIPATION IN THE WORLD HERITAGE PROGRAM: A COUNTY-BASED ECONOMIC EVALUATION

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CHAPTER ONE

INTRODUCTION

Heated debate has recently enveloped the World Heritage program in the United States. Legislation introduced in the 104th thru the 107th Congresses has sought to drastically curtail, if not effectively eliminate U.S. participation in this program. What is the World Heritage program and what evidence merits its perpetuity or discontinuance? The former question must be objectively answered for all participants and spectators of the debate, while the latter has been aired and debated on the floors of Congress. Both sides have focused on issues surrounding the sovereignty of the United States. While the sovereignty debate is worthy of study in its own right, it offers few facts upon which to base a decision concerning the future of World Heritage in the U.S. Additionally, opposing sides of this argument cite issues ranging from the indirect implementation of treaties to the role of U.S. global environmental leadership (U.S. House of Representatives 1998, Young 1999).

However, the economic impacts of World Heritage present a unique opportunity for study. Proponents of the anti-World Heritage legislation have claimed that the international designation can be used to stop development, and subsequently harm local economies. Conversely, proponents of the program cite World Heritage as a local economic boon due to increased levels of tourism (U.S. House of Representatives 1998). In fact, one element of the legislation seeks to assess economic impacts of World Heritage sites on adjacent lands (Young 1999).

The dispute over World Heritage participation should be broadened to address economic effects to surrounding areas. Unfortunately, to date there has been no analysis of the economic effects of World Heritage designation. The economic consideration of World Heritage, while buried behind strong rhetoric tied to the sovereignty debate, provides a unique opportunity to evaluate the program from a perspective that is different from current arguments of the benefits and costs of participation in the program. To provide a more detailed assessment of costs and benefits of World Heritage participation this study provides an analysis of the economic effects of World Heritage designation at the county level.

World Heritage

United States participation in the World Heritage program began in 1972 when U.S. representatives participated in the drafting of the *Convention Concerning the Protection of the World Cultural and Natural Heritage* (Convention). The goal of the Convention was to add an additional layer of recognition and protection to the world's most treasured cultural and natural sites (UNESCO 1995). The United States is home to 20 World Heritage sites including Taos Pueblo (NM) and Independence Hall (Philadelphia, PA), as well as natural sites such as Yellowstone (WY, MT, ID) and the Grand Canyon (AZ).

The World Heritage Committee (WHC) administers World Heritage at the international level, operating under the authority of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The WHC provides support to the respective signatory parties of the Convention by funding technical assistance programs

and mitigating threats through the use of international publicity. The WHC also votes on nominations for new World Heritage sites at its annual meeting. At a signatory state's request, the WHC will visit and assess World Heritage sites facing perceived threats (UNESCO 1997).

In 1995, the WHC visited Yellowstone National Park in response to a request from the United States Department of the Interior (McHugh 2001). The proposed New World Mine, planned within two miles of the park boundary, had stakeholders engaged in a fierce debate. Opposition to the gold mine was coordinated by the Greater Yellowstone Coalition (GYC), which represented individuals, environmental groups, and non-governmental organizations allied in an effort to block the mine (Glick and Alexander 2000). Pressure generated by GYC encouraged a settlement for halting the mine that was facilitated by the Clinton administration (Gebert 1998; Glick and Alexander 2000; Lockhart 1997; O'Connell 1995; Wilkinson 1996). However, the WHC's visit to the proposed site sparked a debate that has proven to be more enduring than the original controversy.

The American Land Sovereignty Protection Act

Introduced in the 104th Congress by representative Don Young of Alaska, the American Land Sovereignty Protection Act (ALSPA) would alter or eliminate U.S. participation in land use designation programs having an internationally sponsored component. Over the years, various incarnations of this legislation have been offered to eliminate U.S. participation in programs such as Man and the Biosphere and the Ramsar Wetlands Convention (Young 1998). Among targeted programs, U.S. participation in

World Heritage has garnered the lion's share of interest. Over the years, ALSPA has received increasing levels of support with subsequent introductions (House of Representatives 2001). Additionally, the spirit of ALSPA may reflect a substantial segment of U.S. public opinion. For example, citizens groups' passionate disapproval of World Heritage can be viewed on a myriad of sites (American Land Rights Association 1999; Concerned Women for America 2000; Sovereignty International, Inc. 1999).

Research Objective

Instead of examining policy, this investigation focuses on the identification of economic impacts associated with World Heritage at the local level. Such impacts have been a focal point for ALSPA proponents (U.S. House of Representatives 1998; Young 1999) in response to the New World Mine saga where developers were effectively blocked from a mining claim, despite its location outside Yellowstone National Park. Proponents of ALSPA have called for an assessment of all proposed and existing economic activity buffering World Heritage sites (Young 1999). Such an assessment would determine whether or not World Heritage designation is inhibiting economic development in adjoining communities.

It should be noted that no data or information regarding economic impacts has been entered into the congressional debate from either side of the issue. The lack of an economic analysis evaluating local impacts of World Heritage underscores the need for a study of this nature. Therefore, this investigation is intended to provide a starting point for systematically evaluating the impact of World Heritage on local communities. In this case, the study of economic performance by industrial sector in counties surrounding

established and potential World Heritage sites is carried out as the comparative basis for determining effects of World Heritage on adjacent lands.

Methodology

This study applies quantitative methods to examine economic impacts of World Heritage designation on surrounding areas. Upon compilation and standardization of appropriate data, test statistics have been utilized to address questions related to the primary focus of inquiry: "Does World Heritage inscription affect county-level economic performance?" This is accomplished utilizing the Wilcoxon rank sum and the Wilcoxon matched-pairs signed-ranks test statistics on two demographically standardized samples. The first sample consists of counties that contain and/or are adjacent to World Heritage sites while the second consists of a similar sample of counties that contain and/or are adjacent to potential World Heritage sites (as defined by the National Park Service 2001).

Industrial sectors tied to natural resources, tourism, and housing development were selected for the analysis. Analysis proceeded by industry. Comparative analysis was aided by data sets corresponding to the year 1972, the year prior to the first World Heritage site and 1997, the year the most contemporary data was available. The comparison of two time periods provides a means of assessing economic circumstances before and after the program was initiated. County population is examined as an additional proxy measure of the economic effect of World Heritage designation.

Significance

The goal of this research is not to evaluate the validity of claims concerning sovereignty or to suggest whether the American Land Sovereignty Protection Act is a reasonable response. Rather, the study aims to provide unique and original information regarding local economic impacts as well as a broader understanding of the settings associated with World Heritage designation. This is accomplished through a twofold statistical approach tailored to the problem. Additional and varied descriptive measures help illuminate not only the economic significance of World Heritage, but also distinctive spatial characteristics and associations.

This investigation arrives at an important time for the future of World Heritage. While members of Congress debate the fate of this program, neither side has offered substantive evidence concerning the economic impacts of World Heritage. Implications of World Heritage to U.S. sovereignty and Executive Branch land-use decision-making power merit discussion, but present little in the way of concrete evidence. On the other hand, an economic analysis of the program provides results to inform the debate. This study takes a first step in this direction.

CHAPTER TWO

SETTING THE STAGE: A WORLD HERITAGE AND AMERICAN LAND SOVEREIGNTY PROTECTION ACT PRIMER

An understanding of the World Heritage program and the American Land Sovereignty Protection Act is critical to this research. The obscure nature of World Heritage in the United States confirms the need for a detailed introduction. In addition, familiarity with the history, mechanics, and terminology of World Heritage as well as the American Land Sovereignty Protection Act provide the reader with a contextual foundation for this study.

World Heritage

History

The World Heritage program was developed to increase recognition of, and aid in protecting the world's most treasured cultural and natural places. Within the United States, 20 places are now World Heritage sites (Fig. 1). Included are lesser-known cultural sites such as Cahokia Mounds State Historic Site in Illinois as well as large national parks such as Yosemite.

The impetus for the World Heritage movement was the 1959 decision by Egypt to build the Aswan High Dam. Construction of this dam and the impending creation of Lake Nasser doomed several archaeological sites within the Nile Valley. In response to this threat, the international community sprang into action to assist Egypt and the Sudan in moving cultural artifacts and monuments. Born from this cooperation was the idea of

a shared responsibility for the preservation of outstanding places. In the years that followed, campaigns in Venice, Italy, Mohenjodaro in Pakistan, and Borobodour in Indonesia again mobilized the international community in the name of preservation. Momentum from these campaigns led to a draft convention protecting global cultural heritage (Batisse 1992).

Figure 1. U.S. World Heritage sites by year of inscription to World Heritage List.

Year	World Heritage site, state; management agency
1978	Mesa Verde National Park, CO; National Park Service (NPS)
1978	Yellowstone National Park and Preserve, ID, MT, WY; NPS
1979	Everglades National Park, FL; NPS
1979	Grand Canyon National Park, AZ; NPS
1979	Independence Hall National Historical Park, PA; NPS
1979	Wrangell - St. Elias National Park and Preserve, AK; NPS
1980	Redwood National Park, CA; NPS
1981	Mammoth Cave National Park, KY; NPS
1981	Olympic National Park, WA; NPS
1982	Cahokia Mounds State Historic Site, IL; Illinois Historic Preservation Agency
1983	Great Smoky Mountains National Park, NC, TN; NPS
1983	La Fortaleza and San Juan Historic Site, Puerto Rico; NPS
1984	Statue of Liberty National Monument, NY; NPS
1984	Yosemite National Park, CA; NPS
1987	Monticello and the University of Virginia (UVA), Charlottesville, VA; NPS and UVA
1987	Chaco Culture National Historical Park, NM; NPS
1987	Hawaii Volcanoes National Park, HI; NPS
1992	Glacier Bay National Park, AK; NPS
1992	Pueblo de Taos, NM; Pueblo de Taos Tribal Council
1995	Carlsbad Caverns National Park, NM; NPS
1995	Glacier National Park, MT; NPS

Simultaneously, a movement in the United States held that natural values contained within some national parks were of international significance and should be protected for all future generations of the world's citizens. The presidents of the Conservation Foundation and Resources for the Future promoted the idea at a White House Conference in 1965. These leaders called for a "World Heritage Trust" that would encourage "...international cooperation to protect the world's superb natural and scenic

areas and historic sites for the present and future benefit of the entire world citizenry" (Batisse 1992, p.14). The World Conservation Union (IUCN) prepared a draft convention based upon this principle.

Convention Concerning the Protection of the World's Cultural and Natural Heritage

Eventually, the goals of the cultural and natural heritage movements came together in a single proposal. On November 16, 1972 the General Conference of United Nations Educational, Scientific, and Cultural Organization (UNESCO) adopted the *Convention Concerning the Protection of World Cultural and Natural Heritage* (Convention). President Richard M. Nixon requested that the ceremony commemorating the U.S. as a signatory party to the new Convention coincide with the centennial celebration of Yellowstone National Park (Batisse 1992).

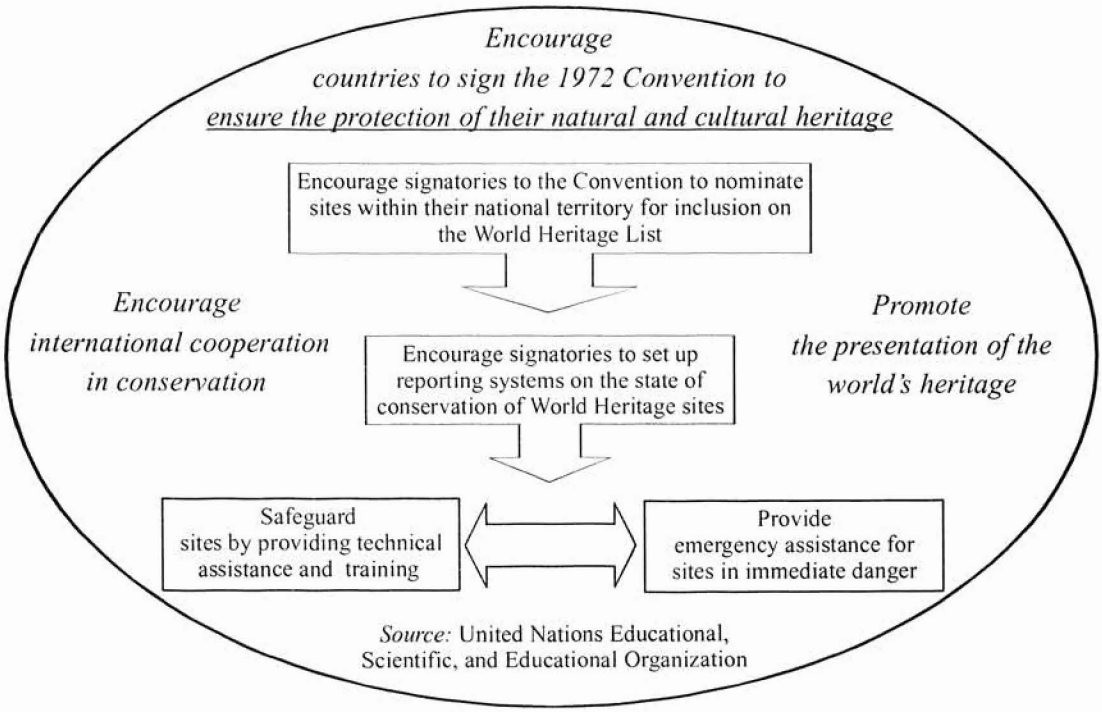
With the Convention, UNESCO seeks to encourage the identification, protection, and preservation of cultural and natural heritage areas having the highest value to humanity. The concept for World Heritage is based on the shared responsibility for sites. The Convention expresses the idea of the Common Heritage of Humankind (CHH) (Atherton and Atherton 1995), a belief that humanity as a whole must act as trustee for all of the greatest cultural and natural sites of the world. UNESCO's World Heritage Mission is conceptually illustrated in Figure 2.

World Heritage Committee

The World Heritage Committee (WHC) is responsible for the implementation of the Convention and has the final word on whether a site is accepted for inscription on the

World Heritage List. Most importantly, the WHC is responsible for examining reports on the state of conservation at World Heritage sites, and subsequently asking state parties to the Convention to take action when mismanagement is evident. In rare instances, the WHC can inscribe a site to the List of World Heritage in Danger at the request of a state party. The WHC consists of 21 representatives of the 173 state parties to the Convention. Representatives are elected to six-year terms of office (UNESCO 2002).

Figure 2. UNESCO's World Heritage mission.



Nomination and Administration

For a site to receive World Heritage designation it must be nominated by the country where it is located and must already be protected (i.e. national park, nature preserve) by that country. The WHC, with the assistance of the International Council on Monuments and Sites and the IUCN, selects the nominated sites that meet the World

Heritage List criteria (UNESCO 1996). Worldwide, there are currently 730 World Heritage sites in 125 countries (UNESCO 2002). The United States has 20 sites inscribed on the World Heritage List (Fig. 1), 17 of which are national parks. Under the National Historic Preservation Act Amendment of 1980, the Department of Interior is charged with coordinating and directing activities under the Convention, in cooperation with the Departments of State, Commerce, Agriculture, the Smithsonian Institution, and the Advisory Council on Historic Preservation (McHugh 2000). The National Park Service administers all the U.S. sites with funds appropriated from Congress, except for several that are owned by states, foundation, or Native American tribes (Fig. 1).

List of World Heritage in Danger

The List of World Heritage in Danger (List) represents current sites that the WHC perceives as seriously endangered. As described in Article 11.4 of the Convention, an endangered site is one that is in jeopardy of its unique qualities being adversely affected through onsite deterioration, persistent neglect, or via external threats. Dangers can be "ascertained" referring to specific and eminent threats, or "potential" when a property is faced with threats that could eventually have a deleterious effect on World Heritage values (UNESCO 1972).

Being listed allows a site to receive special attention and international assistance to manage and/or mitigate threats to the site. By the WHC's admission, inscription to the List is not perceived in the same way by all parties concerned (UNESCO 2000). While most countries apply for the inscription of a site to obtain international attention and assistance, some countries need assistance, yet seek to avoid the designation. In these

cases, they may perceive the designation as a focus for international criticism of deficient site management (UNESCO 2000). Currently, 33 sites are inscribed to the List. Yellowstone National Park (see discussion below) and Everglades National Park are the only two U.S. sites on the List of World Heritage in Danger. In 1993, the Everglades was placed on the endangered list due to the deleterious effects of water consumption, pollution, and draining that were damaging the subtropical wetland. The impetus provided by the WHC helped consummate an agreement between the Department of the Interior and Florida's sugar cane growers to attempt to restore the ecosystem to its original state (Wilkinson 1996).

American Land Sovereignty Protection Act

The American Land Sovereignty Protection Act was proposed in the 105th through 107th Congresses to curtail or eliminate United States' participation in internationally sponsored land protection programs such as World Heritage.

H.R. 883

H.R. 883 is the third incarnation of the American Land Sovereignty Protection Act and addresses the Constitutional power of Congress over management and use of lands belonging to the United States. Sponsors refer to Article IV, Section three of the United States Constitution that addresses Congressional power to make all needful rules and regulations governing lands belonging to the United States. Proponents of the legislation argue that an increasing portion of the nation's public lands have been included in various international land protection programs, such as biosphere reserves

and World Heritage sites, with little Congressional oversight or approval. They maintain that the framework for implementing biosphere reserves and World Heritage sites has eroded the power and sovereignty of Congress to exercise its power to make the laws that govern U.S. lands (U.S. House of Representatives 1999a).

H.R. 883 calls for the Secretary of Interior to obtain the legislative consent of Congress prior to the nomination of a property for inclusion on the World Heritage list. If enacted, a site may not be nominated until it has been determined by the Secretary that existing commercially viable uses of the nominated land and/or land within ten miles of the area will not be adversely affected by inclusion on the list. A report regarding any impacts of inclusion on resource development of the land would be required. Also, the Secretary must obtain Congressional approval before assenting to the inscription of a U.S. World Heritage site to the List of World Heritage in Danger (U.S. House of Representatives 1999a). Nomination of land for biosphere reserves will be prohibited and existing United States biosphere reserves will be terminated unless they conform to the new guidelines (U.S. House of Representatives 1999a). The final provision of the bill prohibits federal officials from designating any land in the United States for a special or restricted use under any international agreement unless Congress specifically approves such designation (U.S. House of Representatives 1999a).

Impetus

What prompts legislation seeking to eliminate long-standing resource protection programs such as Man and the Biosphere and World Heritage? Review of Congressional debate points to the case of the New World Mine, near Yellowstone National Park as the

primary catalyst. From a broader perspective, H.R. 883 sponsors believe that the Executive Branch wields excessive influence within the realm of domestic land use policy-making (U.S. House of Representatives 1999a). These are the primary themes delineated in Congressional debate and merit further review.

Yellowstone and the New World Mine

Yellowstone was added to the List of World Heritage in Danger on December 5, 1995 (Wilkinson 1996). The decision was finalized after four representatives of the WHC toured the Yellowstone area in September 1995 following an official invitation from the U.S. Government (O'Connell 1995). This represented the first time the WHC had been asked to visit a potentially threatened U.S. site. A variety of issues ranging from threatened grizzly bears to chronic overcrowding and geothermal development were cited as justification for placing Yellowstone on the endangered list. However, the proposed New World Mine garnered the bulk of attention.

The proposed mine, backed by Crown Butte Mines, Inc., would have been located in a remote area two to three miles from the northeast corner of Yellowstone. Permanent containment of toxic tailings was what most concerned opponents of the mine. Two sites favored by developers would have located the tailings impoundment area in watersheds of rivers that flow into Yellowstone (Lockhart 1997). Additionally, opponents claimed that the mine would create an additional 715 acres of roads and industrialization in the prime habitat needed to support grizzly bears (Lockhart 1997). Intangible park resources such as silence and solitude could have also been adversely affected by the project (Lockhart 1997).

In August 1996, a settlement in the disputes over development of the New World Mine was reached. Under the agreement, Crown Butte traded the proposed mining area for federal properties of equivalent value (Lockhart 1997). The federal government was authorized to spend up to $65 million to complete the arrangement (Gebert 1998).

The Curtailment of Executive Authority

The second major impetus for ALSPA legislation was the desire to curtail the Executive Branch's land use designation powers. Earlier versions of ALSPA included companion legislation to eliminate the President's power to create national monuments under the Antiquities Act. While the most recent version of ALSPA does not directly challenge the President's power under the Antiquities Act, it would place all decisions concerning the World Heritage and Man and the Biosphere programs in the hands of Congress.

The Debate

A review of Congressional debate highlights some common themes regarding ALSPA that are presented in Figures 3 and 4. The respective viewpoints are followed by an assessment of World Heritage Committee intervention in the 30 years since its inception. Other than the oft-cited case of Yellowstone and the New World Mine, a review of the WHC's actions has been a noticeably lacking component of the debate.

ALSPA Supporters

The first noteworthy pro-ALSPA theme is closely tied to the focus of this investigation. Supporters have claimed that local economies are adversely affected by World Heritage designation. By agreeing to manage sites in accordance with the international Convention, proponents suggest that World Heritage designation has resulted in lost revenue and local jobs, along with an undermining of private property rights. In an oversight hearing on World Heritage, Representative Helen Chenowith-Hage stated, "World Heritage status has been used as a political weapon to stop gold mining on private property outside [Yellowstone] Park" (U.S. House of Representatives 1999b, p. 7). Representative John Sweeney added, "...there have been a number of instances where private property owners in the use of their property, in the valuation of their property and their ability to develop and cultivate that property have been infringed upon based on a [U.N.] designation (U.S. House of Representatives 1999a, p. 79).

Furthermore, champions of ALSPA believe environmentalists are actively utilizing the international designation to stop development in the vicinity of World Heritage sites (McHugh 2000). Senator Malcolm Wallop described World Heritage as "... as another weapon in the arsenal of environmental pressure groups to stop economic development all over the world" (U.S. House of Representatives 1999b, p. 52).

The second common theme focuses on domestic land use policy. ALSPA supporters contend that designation of United Nations' World Heritage sites and biosphere reserves result in further centralization of policy-making authority at the federal level, particularly in the Executive Branch. They state that these sites have been designated with no congressional oversight or public hearings. Through these

international designations, the Executive Branch is able to guide domestic land use policies without consulting Congress (U.S. House of Representatives 1999a). They also note that Article IV, Section Three, of the U.S. Constitution states, "Congress shall have the power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States" (U.S. House of Representatives 1999a).

The third and fourth commonly cited theme in support of ALSPA focuses on the international composition of the World Heritage administrative body. ALSPA supporters voice concern that the WHC, with its multinational representation, does not represent the American people with its administrative actions. The House Committee on Resources has declared that through participation in these programs, the international community has an open invitation to interfere in U.S. domestic land use decisions (1999). From the perspective of ALSPA supporters, the New World Mine provides an example of this type of interference. This comment by Jeane Kirkpatrick, former U.S. ambassador to the United Nations, sums up the pro-ALSPA position:

> In U.N. organizations, there is no accountability. U.N. bureaucrats are far removed from the American voters. What recourse does an American voter have when U.N. bureaucrats from Cuba, Iraq, or Libya, all of who are parties to this treaty, have made a decision that unjustly damages his or her property rights that lie near a national park? (U.S. House of Representatives 1999a, p. 8).

Figure 3. Pro-ALSPA themes.

- Environmentalists use World Heritage to stop development projects and subsequently local economies suffer
- Land use policy is too centralized in the Executive Branch
- The international committees that administer these programs do not represent Americans
- Some members of committees represent governments not based on democratic principles
- Through participation in World Heritage, the U.S. implements terms of international treaties to which it is not a party

The final theme of ALSPA supporters is directed at the perceived broader effect of international land use programs. The House Committee on Resources concluded that in becoming a party to international land use agreements, the U.S. might be indirectly implementing international treaties such as the *Convention on Biological Diversity*, to which the U.S. is not a party and to which the U.S. Senate has refused to ratify (1999). An oft-cited point relates to *The Seville Strategy for Biosphere Reserves* that includes a provision that recommends adherence to Article six of the *Convention on Biological Diversity* (UNESCO 1995). If managers of U.S. biosphere reserves were adhering to the global biosphere reserve strategy established in Spain, claim ALSPA proponents, then the U.S. would be indirectly implementing the *Convention on Biological Diversity*.

ALSPA Detractors

Anti-ALSPA voices believe there is no merit to the claim of ceded sovereignty as a result of participation in international programs such as World Heritage. Article four of the Convention is commonly cited as it specifies that "...the sovereignty of individual countries is to be respected, and that no physical interference may take place on behalf of a site without the full consent of the affected state" (UNESCO 1972). The Department of State has testified that under terms of the Convention, management and sovereignty over the sites remains with the country where the site is located (McHugh 2000). Furthermore, the nomination of a site is a voluntary act that commences within signatory countries of the Convention (UNESCO 1972). Beyond listing sites, providing technical

assistance and financial aid, and generating publicity, the Department of State has determined that the WHC has no authority (McHugh 2000).

Opponents of ALSPA have dubbed the legislation "the Black Helicopter Bill" in reference to what they perceive as paranoia of a global government (U.S. House of Representatives 1999a). They state that this legislation caters to conspiracy theories of extreme organizations and individuals. Furthermore, ALSPA detractors believe that distaste for the United Nations has been the source of misconceptions that they claim have been an integral part of ALSPA supporters' rhetoric (U.S. House of Representatives 1999a).

A third frequently discussed theme relates to global environmental leadership. Opponents fear that reneging on U.S. commitments to these programs would strike a blow to future opportunities for U.S. leadership in environmental conservation and in the protection of historical and cultural resources (U.S. House of Representatives 1999a). Moreover, they think U.S. participation in these programs is emblematic of the symbolic value and importance the U.S. places on its cultural and natural resources (U.S. House of Representatives 1999a). Withdrawal from World Heritage would be particularly ironic since the U.S. forged the path to its implementation.

Fourth, ALSPA detractors believe that the provisions established by the legislation would effectively eliminate these programs. They state that the buffer zone of no economic effects that ALSPA would dictate is an impossible mandate. They believe the goal of this legislation is not to regulate these programs, but to

abandon them. To service this goal, they claim that ALSPA was purposefully designed to be an insurmountable test (U.S. House of Representatives 1999a).

Figure 4. Anti-ALSPA themes.

- In response to the question of sovereignty, the Congressional Research Service said "the [World Heritage Committee] has no role or authority beyond listing sites and offering technical advice and assistance"
- The legislation is based on emotionalism and distaste for the United Nations
- ALSPA is a threat to the United States international leadership in environmental conservation
- The proposed provisions would effectively kill World Heritage
- The programs do not stop economic growth. Resultant tourism is a large economic benefit of the designations

While detailed evidence has not been cited, ALSPA opponents maintain that World Heritage designation is economically beneficial. Increased tourism is cited most often as an economic benefit. In Congressional testimony, Representative Mark Udall of Colorado claimed that World Heritage and biosphere reserve designations equated to increased visitation at designated parks, as well as increased research, and general economic benefits for surrounding communities (U.S. House of Representatives 1999a). Hawaiian Senator Daniel Akaka asserted that World Heritage status was partially responsible for more than 500,000 international visitors to Hawaii Volcanoes National Park on an annual basis (U.S. House of Representatives 1999a).

Perhaps what is most notable about the ALSPA debate in Congress is what is found lacking in the arguments presented by opposing sides. While proponents and detractors both cite economic concerns in their stance on ALSPA, neither side offers any substantive economic data or analysis to support their viewpoint. A second shortcoming

lies in the lack of review of previous WHC action. How has the WHC influenced the affairs of sovereign states over its 30-year history? What types of situations have elicited a response from the World Heritage Committee? What forms have the responses taken? Documented cases of intervention by the WHC provide answers to these questions.

WHC Intervention

In 1986 Greece nominated the ancient city of Delphi to be listed as a World Heritage site to address threats from dust and pollution from a nearby proposed aluminum smelter. Due to the impending threat, the committee ruled to indefinitely delay the nomination process. Public sentiment supported action on the nomination, so the Greeks found an alternate site for the smelter. Delphi was subsequently designated a World Heritage site (Atherton and Atherton 1995).

In 1989 the Royal Chitwan National Park faced a proposal by the Nepalese government to flood much of the park's grasslands as part of an ambitious irrigation project. Loss of habitat for the resident herds of elephant and rhinoceros would have occurred with the plan. Intervention by the committee came in the form of a recommendation that an environmental impact assessment be completed before proceeding with the project. The report showed that economic impacts from damage to the famous game reserve would overwhelmingly outweigh the economic advantages of the proposed project. Upon review of this report, the Nepalese government decided to abandon the irrigation project (Atherton and Atherton 1995).

The case of Venice, Italy provides another example. In 1989, the Italian government nominated Venice as the host-city for Expo 2000. An event of this

magnitude would have required dramatic improvements in Venetian infrastructure to accommodate the influx of tourists. The committee feared the improvements required to win the bid would have irreparably harmed the already delicate city. The WHC was one part of an international consortium that opposed the event. Pressure from these international sources eventually led Italy to withdraw its nomination for the event (Atherton and Atherton 1995).

As for Yellowstone, the WHC was not acting alone in its opposition to the mine project. An upwelling of support to block the project brought together individuals, nongovernmental organizations, conservation groups and some agencies of the federal government. The U.S. government, 14 conservation groups, and 37 American leaders and dignitaries had urged the WHC to bring "international recognition" to the developing situation near Yellowstone (O'Connell 1995, p.11).

The WHC added an international element to the conglomerate opposed to the mine. The ability to create international awareness and opposition to the project was the niche filled by the WHC. "The real bargaining chip is public visibility," said Rob Milne, former head of the National Park Service's Office of International Affairs (Wilkinson 1996, p. 40). This is what makes the WHC a sought after ally for proponents of preservation battles involving World Heritage sites. The international eye can be more readily captured with the help of an international organization.

Yellowstone is not the only example of the WHC generating increased visibility in North America, or for that matter, within the realm of mine development. In fact, the U.S. called upon the WHC in 1993 to support its bid to halt a Canadian open pit mine near Glacier Bay National Park and Preserve (McHugh 2000). The WHC publicized U.S.

concerns while reminding Canada of its obligations under the Convention. The Committee led a coalition of over 50 conservation groups that opposed further mineral development in the vicinity (UNEP 2001).

An intriguing precedent was set in the case of the Old City of Dubrovnik, in the former Yugoslavia in 1991. War had engulfed the immediate area. The WHC has made a practice of intervening on behalf of a site only after a request from some element of the state party. However, in contrast to the aforementioned cases, the committee listed Dubrovnik as an endangered site without receiving a request from the Yugoslavian government (Atherton and Atherton, 1995). The Old City of Dubrovnik has since been removed from the List of World Heritage in Danger and is cited on the World Heritage website as one of its greatest success stories. According to the WHC, adding Dubrovnik to the endangered list was successful in generating global attention to the threat and assisting in the raising of funds for restoration (UNESCO 2000).

It should be noted that in some cases the combined forces of legal pressure and public opinion have been insufficient to stop threats to sites. For instance, a proposed mining project at the Mount Nimba Reserve, which straddles the border between Cote d'Ivoire and Guinea, moved forward despite vigorous protest initiated by the Committee. Degradation in and around World Heritage sites continues to be an issue for the 33 sites remaining on the endangered list (UNESCO 2002). In the Democratic Republic of the Congo, where all five World Heritage sites are endangered, little progress toward threat remediation has been reported (UNESCO 2002). In countries ravaged by war and subject to widespread humanitarian problems, threats to World Heritage sites are likely viewed

as secondary problems. Likewise, WHC rhetoric is less likely to generate the political notoriety that was seen in the case of Yellowstone.

In the examples above, the WHC "intervened" in a range of situations at various World Heritage sites. Their coercive powers have been evidenced at established sites such as Venice and Yellowstone, as well as the potential site of Delphi. Future threats have been addressed more often than current perils. Excluding the case of Dubrovnik, the committee has acted only when assistance has been requested.

What occurred in the case of Yugoslavia was noticeably different. The move more closely paralleled a United Nations response to a humanitarian crisis. Although the city, surrounded by armed conflict, was undoubtedly in peril, this move raised an eyebrow from those wary of the Committee. Several points should be made regarding this event. First, the international community displayed strong support for the move (Atherton and Atherton 1995). Second, principles of the Convention were not violated since there was no physical interference imposed upon Yugoslavia. Third and most importantly, the singular quality of the event should be noted. The WHC has not moved in this way since the Dubrovnik listing.

As the preceding information notes, the complexity of the issue becomes evident. While this study evaluates the economic role of World Heritage, it is essential that the reader have a background of some of these key components of World Heritage. Only through an understanding of the World Heritage milieu is one able to fully understand the thrust and significance of this study.

CHAPTER THREE

LITERATURE REVIEW

Contextual Setting

World Heritage plays an inconspicuous role within 20 United States' parks and protected areas. Many people are unaware that the program exists, while greater numbers are uninformed about its mission (Atherton and Atherton 1995). In fact, it represents another layer of recognition and protection for some of this country's most cherished sites. On the other hand, there are some who feel that this extra layer of protection represents an infringement on United States' sovereignty as well as an economic liability to surrounding areas (Young 1999). The varying forms of regulation placed upon the public lands of this country have been an ongoing source of contention for politicians and the general public (Shepard 1984; Young 1998). Perceived as a manifestation of international regulation, the virtues and ills of World Heritage have been hotly debated in the legislative halls of the U.S. since 1995 (Young 1999). Within the U.S., the program stands at a crossroads in terms of its survival.

It is an ironic position for World Heritage. The goal of developing a mechanism to identify and protect the world's most precious resources was spearheaded by the United States in the late 1960's and early 1970's (Batisse 1992; Cameron 1993; Gebert 1998; McHugh 2000; UNESCO 1996). The *Convention Concerning the Protection of the World's Cultural and Natural Heritage*, ratified in 1972 was a landmark in a year when environmental issues were recognized as matters of international concern (O'Neill 1996; Schreurs 1997). The World Heritage regime has since played an important role in

identifying globally significant natural and cultural resources and subsequently aiding in their protection through increased recognition, technical advice, and monetary assistance.

World Heritage has not been a popular topic within academia. Beyond the plethora of general information that can be obtained from UNESCO sources, little exists in the way of critical appraisal of the program. Batisse (1992) has compiled a retrospective on the inception and development of World Heritage that examines political tradeoffs, the importance of monitoring, and the ability of the *Convention* to protect resources. Additionally, Atherton and Atherton (1995) discussed the implications of World Heritage to national sovereignty, including the benefits and drawbacks to receiving assistance from the World Heritage Committee. A compilation and discussion of the World Heritage Committee's interventions was provided in chapter two of this study. Several others have provided perspective on the World Heritage movement as it nears its 30th anniversary (Gebert 1998; Pocock 1997).

American Land Sovereignty Protection Act

A relatively recent response to the World Heritage program in the United States is the American Land Sovereignty Protection Act (Young 1999). This legislation has been introduced three times in the House of Representatives and once in the Senate over the last seven years (1995-2001). Supporters of this legislation claim that the WHC is "meddling in U.S. sovereignty" (Wilkinson 1996, p. 38). Opponents of ALSPA counter these claims by unequivocally stating that World Heritage does not "...usurp a nation's sovereignty, infringe upon private property rights, or result in economic sanctions or boycotts levied against specific industries" (Wilkinson 1996, p. 39).

ALSPA seeks a U.S. withdrawal from participation in internationally sponsored land protection programs such as World Heritage and the Man and the Biosphere program (Baker 1996; Batisse 1997). However, Shafer (1999) argues that proponents of ALSPA should proceed with caution since the implications of withdrawing from these programs could be significant, including a diminished role in global environmental leadership.

Not only are the potential implications of this legislation significant, the publicity for World Heritage generated by this controversy is noteworthy. The long-term effects of this publicity have yet to manifest. However, Milman and Pizam (1995) studied the effect of image and familiarity with a destination as a factor in park visitation. In the long run, the Congressional debate may benefit World Heritage in the United States by increasing awareness in a program that has maintained a low profile among preservation programs.

The New World Mine

The impetus for opposition to World Heritage appears to be rooted in the confrontation that occurred near Yellowstone National Park in 1995. Yellowstone is one of a dozen inaugural World Heritage sites (Wilkinson 1996). It is undoubtedly one of the most beloved, as well as ecologically unique places in the U.S. (Jobes 1993). This helps explain the massive opposition to a proposed gold mine near the park.

The New World Mine would have produced as much as 5.5 million tons of tailings (Lockhart 1997). Associated environmental impacts included extensive road building and loss of grizzly habitat (Gebert 1998; O'Connell 1995; Wilkinson 1996).

One of the myriad voices critical of the mine was the WHC. Kaul, Grunberg, and Stern (1999) studied the way in which non-state actors such as the WHC can pressure governments in situations such as this. However, it remains unclear whether WHC pressure had a hand in the eventual outcome. The plan was halted through intensive negotiation and a settlement that included a $65 million payment to the developers (Gebert 1998; Glick and Alexander 2000).

While the role of the WHC in stopping the mine is debatable, the WHC did alert the world community to a potential external threat to Yellowstone, as well as document threats to the park. The lack of comprehensive documentation and compilation of external threats to national parks has been an ongoing problem (GAO 1994; Howe, McMahon and Propst 1997; NPCA 1979; Schonewold-Cox 1992). In fact, the National Park Service has not only left threats undocumented, in some cases it has inadequately protected park resources from outside threats once they have been identified (Lockhart 1997). In the case of Yellowstone, the World Heritage Convention may have done exactly what it was intended to accomplish; provide additional protection through enhanced recognition. Critics question at what cost to national sovereignty and local economic viability did this occur?

State Sovereignty

The delicate balance between state sovereignty and international intervention in the case of World Heritage has been noted (Atherton and Atherton 1995; Cameron 1992). At this point it is helpful to understand the operational definition of sovereignty. Adopted from Raustiala (1996), sovereignty refers to a sovereign state maintaining

supreme authority over its territory. International intervention in the case of World Heritage refers first and foremost to pressure generated by the World Heritage Committee. Additionally, intervention may include technical assistance and financial aid from the WHC at the request of a Convention signatory state.

Cameron (1992) and Shepard (1984) observe that the WHC is powerless to intervene based on the fact they must be invited to visit the country in question, while Conca (1994) adds that international agreements actually strengthen state sovereignty. Gebert (1998) takes his comprehensive analysis of sovereignty under the World Heritage Convention a step further by suggesting that World Heritage participation presents "no threat" to state sovereignty.

On the other hand, Raustiala (1996) makes a compelling case for limiting the development of international environmental agreements such as the World Heritage Convention. He points out that environmental regimes are rarely slowed or stopped. He does believe, however that World Heritage presents less of a threat than another targeted program, Man and the Biosphere. The lack of a ratified agreement with Man and the Biosphere impairs political accountability. Conversely, Schreurs (1997) believes that programs that do have a ratified agreement are a greater threat due to the subsequent limitation on operational sovereignty. Schreurs concludes that state sovereignty is clearly under challenge by participation in these programs.

It remains to be determined whether the effects upon state sovereignty are as clear as either Gebert or Schreurs have implied. However, the research of Pocock (1997) finds middle ground, suggesting that the erosional effects on state sovereignty are in the hands

of the participating state. To illustrate, he points out the variations in states' willingness to 'open' sites to monitoring following official inscription.

One way to evaluate sovereignty implications is to look at past performance of the World Heritage Committee. Beyond the discussion presented in chapter two, Atherton and Atherton describe WHC intervention on a case-by-case basis (1995). This review is helpful in judging past actions of the WHC. When comparing these actions with the scenarios of ceded sovereignty presented by Gebert (1998), the WHC does not appear to be usurping state sovereignty. Several authors have noted a consistent weakness of the World Heritage Convention. Cameron (1992), Gebert (1998), Pocock (1997), and Wilkinson (1996) describe the lack of standardized criteria in monitoring World Heritage sites for degradation.

Australia's Example

One particular body of literature that merits review is Australia's documented experience with World Heritage. In fact, the sparse literature regarding World Heritage is focused on Australia since there has been more political wrangling in Australia over World Heritage than any other place (Lane, Corbett, and Macdonald 1996). Unlike the American experience, issues of sovereignty as well as economic impacts have been addressed. Australia may be the best example of a country living up to a rigid interpretation of the obligations expressed in the Convention. This has been partially accomplished by passing supplementary legislation that serves to enhance the protections afforded to World Heritage listed sites.

The Australian legislation known as the *World Heritage Properties Conservation Act of 1983* is a set of federal laws that closely mirrors, and even amplifies, the objectives of the World Heritage Convention. Sections nine and ten of the World Heritage Act specifically address activities that may occur outside World Heritage sites but may adversely affect the designated sites (Fleming 1997). The Australian legislation does not allow landholders in and adjacent to proposed areas to appeal proposed boundaries nor does it offer compensation where World Heritage restricts land use (Dick 1995). Needless to say this has been the source of substantial debate and litigation.

Subsequently, numerous Australian court rulings have upheld the legal duty of Australia to protect World Heritage sites (Atherton and Atherton 1995; Dowling 1993; Fleming 1997). Again, this includes adjacent areas that are outside the boundaries of World Heritage sites (Fleming 1997). Outside economic factors have been afforded little or no weight in protecting World Heritage resources (Dowling 1993; Fleming 1997). Dick (1995) provides examples of Australian landowners who have suffered due to World Heritage, providing an interesting contrast to the New World Mine case. Pastoralists and farmer organizations have been the primary protestors as strict cropping and clearing restrictions have been imposed (Dick 1995). Although land values have dropped, the World Heritage Act dictates that landowners are not to be compensated unless the Commonwealth has acquired land for the designated site (Fleming 1997).

The issue of sovereignty is brought forth in the discussion of state control versus commonwealth control of World Heritage assets in Australia (Burritt and Gibson 1993; Dowling 1993). Dowling (1993) documents one case where locals thought they would be losing autonomy with World Heritage inscription. Ironically, local concern with

sovereignty issues has always focused on local landowners ceding sovereignty to the powers of the Commonwealth. Concerns over sovereignty being ceded to international elements have not been raised in the literature.

Recently, the Jabiluka Uranium Mine, near Kakadu World Heritage site has garnered the attention of the WHC (Carlton 1998; Pockley 1999). Kakadu was not added to the List of World Heritage in Danger after a WHC visit to the site determined that there was not an immediate threat. Carlton (1998) claims the WHC has not been an effective deterrent to mine development, but that it has added international attention and public recognition to the debate.

Economic Impacts

Ecosystem Management and Buffer Zones

Transitioning to the primary focus of this investigation, the literature regarding economic impacts is somewhat convoluted. It should be noted that literature regarding the economic impacts of World Heritage sites is non-existent for the United States. Therefore, a review of literature regarding economic impacts of national parks and protected areas will be utilized as a proxy. Particular attention in this review is directed toward Yellowstone, which has garnered the majority of attention in pertinent literature. Additionally, Yellowstone fulfills a dual role of national park and World Heritage site.

Two related concepts that are tied to defining a realm of economic influence for World Heritage sites should be briefly introduced before proceeding, ecosystem management and buffer zones. These concepts are particularly pertinent to World Heritage. Proponents of ALSPA often cite fears that World Heritage designation

promotes management policies that extend far beyond the boundaries of the World Heritage site (Young 1999). In accordance with Article 11, paragraph four of the Convention, signatory states are required to monitor a host of threats that could have deleterious effects on sites (UNESCO 1972). Regional planning projects, town planning, and industrial and agricultural development including mining and logging are but a few of the defined external threats to be monitored (UNESCO 1972). Opponents to World Heritage believe that managing these lands from the broader perspective of an ecosystem management approach or with a concentric buffer zone approach will adversely affect opportunities for economic development.

It has long been recognized that national parks are not complete ecosystems and that their long-term protection depends on how surrounding lands are managed (McNeely 1990; Yaffee 1996). The last decade has witnessed a change in management paradigms from sustained yields to ecosystem management and collaborative decision-making (Cortner and Moote 1994; Morehouse 1996; Schonewold-Cox 1992). Grumbine set forth a definition of ecosystem management:

> Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and value framework toward the general goal of protecting native ecosystem integrity over the long term (1994, p.27).

Opposition to ecosystem management has focused on government control issues and implications for private property (Geisler and Bedford 1998; Reading, Clark, and Kellert 1994).

Similarly, buffer zones have proven to be a point of great contention. A buffer zone is a concentric ring of land adjacent to a protected area that acts as a barrier to

external threats emanating from non-protected lands (Shafer 1999). Shafer (1999) and Gebert (1998) have documented "massive opposition" to buffer zones by the general public.

Yellowstone

Management techniques associated with buffer zones and ecosystem management have been applied to the Greater Yellowstone Ecosystem (GYE) (Clark et al 1991; Geisler and Bedford 1998; Shafer 1999; Jobes 1991; Jobes 1993; Reading, Clark and Kellert 1994). The GYE is an 18-million acre ecosystem that is roughly centered on Yellowstone and Grand Teton National Parks (Greater Yellowstone Coalition 2002). It represents one of the largest relatively intact temperate ecosystems on Earth. However, attempts to manage Yellowstone and surrounding lands as a single, cohesive unit have been problematic and unpopular with some local residents (Clark et al. 1991; Geisler and Bedford 1998). The attitudes and perceptions of local residents in regard to park economics have been the subject of study (Allen 1993; Dawson et al. 1993; Glick and Alexander 2000; Soden 1995). The most accurate portrayal of attitudes can be obtained when the entire economy is compared with attitudes, rather than just the tourist industry (Allen 1993). However, Jobes (1991) cautions that geographically based economic data often have little correlation with residents' attitudes toward park economics. By this he infers that economic indicators are too often utilized as proxies for quality of life.

Economic impacts in the region surrounding Yellowstone have been a popular subject in recent years (Glick and Alexander 2000; Howe, McMahon, and Propst 1997; Jobes 1993; Power 1991; Reading, Clark, and Kellert 1994). This can be explained by the

transitioning economy and the visible debate over the New World Mine (Howe, McMahon, and Propst 1997; Power 1991). Jobes (1993) underscores the significance of the transformation of the GYE from an extractive industry focus to recreation. He states, "...permanent residents have wagered their lives on assumptions regarding resource use" (Jobes 1993, p.155).

Yellowstone National Park is at the heart of the transformation of the GYE economy. It is viewed as the regional "cash cow" (Glick and Alexander 2000). The economy of the region has maintained a robust growth rate over the last decade, even in the face of significant declines in natural resource extraction (Glick and Alexander 2000; Howe, McMahon, and Propst 1997). In many cases, this continues to be countered by increased tourism (English, Marcouiller, and Cordell 2000). In fact, many counties of the West are now dependent on tourism income (English, Marcouiller, and Cordell 2000) as well as quality of life and amenity resources (Beale and Johnson 1998; Morton 2001).

Tourism is not the only source of revenue in the GYE. Reading, Clark, and Kellert document the economic development of the GYE in their 1994 study. A significant influx of capital is now being generated through retirees who have moved into the region (Power 1991; Reading, Clark, and Kellert 1994). Non-retiree migrants often bring their businesses with them. The most rapidly growing service sectors of the GYE economy in 1995 were health, business, and engineering and management services (Glick and Alexander 2000). Additionally, businesses from a variety of non-extractive industries are locating near Yellowstone to accommodate the boom of migrants moving into the numerous new subdivisions and trophy homes (Glick and Alexander 2000; Howe, McMahon, and Propst 1997).

These location decisions are largely related to quality of life issues (Glick and Alexander 2000; Morton 2001). This confirms research by Beale and Johnson (1998), Howe, McMahon, and Propst (1997), and Morton (2001) that suggests preserving character and natural values of the landscape are important to economic growth. Dowling (1993) adds that the more local people benefit from tourism, the more they will benefit from a commitment to preserve the environmental features that attract tourism.

Impacts of Parks and Protected Areas

From a broader perspective, estimation of economic impacts from parks and protected areas has produced a highly variable set of results (Dawson et al. 1993). Dawson et al. (1993) found the impacts to be minimal, while Beale and Johnson (1998), Dean et al (1978), McNeely (1990), Morton (2001), and Power (2001) claim significant economic benefits for surrounding areas. Others, such as Duffy-Deno (1998) and Schroeder (1982), have found data to be inconclusive. However, the results have been largely dependent upon the method used (English, Marcouiller, and Cordell 2000). Regional definitions, variable clustering, and tourism resource variables are but a few of the numerous variations encountered between the studies.

Dawson et al. (1993) examined the area around Great Basin National Park to ascertain the impacts of national park visitation on local economies. The authors found that the park had a relatively small economic impact on local counties. This was largely a result of the remote location of the park and a lack of economic infrastructure supporting tourism in surrounding communities.

In a review of the economic impacts of state parks, Dean et al. (1978) found that the presence of state parks had multiple effects on local areas. These included direct payroll and income impacts on the local area primarily through state expenditures, and secondarily, as the recipients of these expenditures spend locally. Additionally, the contributions of park visitors on the local economy indirectly generated greater local payrolls and income.

In a qualitative assessment of park impacts in a variety of international settings, McNeely (1990) found that economic benefits of parks are more likely to benefit local populations when residents are included in decision-making and educated about park resources. In these cases, it has been demonstrated that most parks are found to deliver more economic benefits than the costs involved in managing them. This assessment applies to protected areas in a broad range of socioeconomic and political contexts.

In an earlier study, Schroeder (1982) attempted to determine the relationship between residential property values and parks and recreation services. The author found that there was no evidence to indicate a relationship between the study variables. From this finding, the author offers no support to the theory that good public parks and recreation services improve property values.

Problems with measuring economic impacts of parks have been documented by English, Marcouiller, and Cordell (2000), Johnson (1993), Leatherman and Marcouiller (1996), Power (1991), Wong (1996), and Yaffee (1996). Johnson (1993) highlights the difficulty in ascertaining economic impacts associated solely with a particular recreation resource. This problem is inherent to most economic analysis of parks and protected

areas. Although the most complex models attempt to isolate the effects, it is an ongoing challenge for researchers.

English and Bergstrom (1994) point out that most studies rely on some form of ad hoc procedure for analyzing the economic impacts of parks and protected areas. A few examples of utilizing proxy measurements for tourism and or economic impacts can be found in the work of Duffy-Deno (1997, 1998), Leatherman and Marcouiller (1996), Morton (2001), Wong (1996), and Yaffee (1996).

Studies have sometimes suffered from overgeneralization associated with county-level aggregated data (Carlino and Mills 1987; Power 1991) and from difficulties of separating economic impacts of visitors from residents (English, Marcouiller, and Cordell 2000). The absence of primary data that is usually associated with these projects is yet another barrier (Leatherman and Marcouiller 1996).

Another problem with estimating economic impacts of parks and protected areas is the relative lack of this type of research, particularly regarding national parks (Dawson et al. 1993), and World Heritage sites. Leatherman and Marcouiller (1996) have compiled the most comprehensive review of pertinent literature to date. Three works worthy of note are Rothman (1995, 2000) and Soden (1995). Rothman (1995) establishes an argument that national parks provide enormous economic and social benefits above and beyond other tourist destinations. He adds that economic possibilities are a major factor of national park creation, particularly in rural areas (Rothman 2000). Soden (1995) investigates the relationship between national parks and local communities.

Power (2001) has written extensively on economic issues related to preserved lands in the western U.S. His statistical analysis of all western U.S. counties showed that

higher percentages of land associated with national park, national monument, and wilderness designations correlated with higher rates of employment growth for the period 1969-1997. Similarly, Rudzitis and Johnson have noted local economic growth rates two to six times those for other non-metropolitan areas for the period 1960-1990 in counties containing national parks, national monuments and wilderness (2000). Additionally, Power noted a positive correlation between income and employment growth according to the amount of protected area within 50 miles of the center of rural western counties (2001). Power also states that protected lands drew new residents who were willing to sacrifice a certain amount of income in order to live in the high-quality natural environments that they perceived federally protected landscapes would provide.

Duffy-Deno's work is somewhat analogous to this study (1997, 1998). Duffy-Deno has set out to measure the county level economic impacts of federal wilderness and state parks in respective studies. Duffy-Deno's wilderness study is particularly noteworthy because it reviews the economic effects of designated areas that some construe to have adverse economic impacts (1998). Duffy-Deno notes that the most significant conflict over wilderness designation involves the real versus the perceived economic effects. Utilizing a disequilibrium model of population and economic growth, he found neither direct, nor indirect associations between county growth and the presence of federal wilderness between 1980 and 1990. Duffy-Deno suggests that this finding indicates that wilderness designation may cause, on average, little economic harm to county economies. Additionally, the author found no empirical evidence to validate concerns that wilderness adversely affected county level earnings in resource related

sectors. The author concludes that caution should be exercised in asserting that wilderness designation is economically detrimental (Duffy-Deno 1998).

In another study with similar threads, Morton (2001) provides before and after snapshots of county level economic performance for Garfield and Kane Counties, Utah. Total jobs, unemployment rate, gross sales, and total personal income are several of the measures utilized to highlight potential impacts of the Grand Staircase-Escalante National Monument on county economics. Morton found that, contrary to local sentiment, counties surrounding Grand Staircase Escalante National Monument have fared well since designation of the monument in 1996. Unemployment has decreased while jobs, wages, and per capita income have all increased. Morton concludes that quality of life and amenity resources such as scenic vistas, wildlife, and recreation opportunities are equally, if not, more important to the regional economy than extracting and exporting natural resources (2001). While some local residents voiced strong opposition to the monument, it appears that designation of the monument has promoted economic development in Garfield and Kane Counties, Utah. Subsequently, he sees the greatest contribution of public lands to future community development to lie in amenity-based community development.

Another related measure is found in the work of Beale and Johnson (1998) who identified non-metropolitan counties in the USA with significant concentrations of recreational activity. Within the 285 counties identified, net migration accounted for the majority of population growth, exceeding that of non-recreational counties. This represented the proxy measure of recreation's economic impact. Net migration has accounted for the majority of population growth in recreational counties during the 24

years considered. Counties with a significant amount of recreational activity within their boundaries were the fastest growing (population) types of non-metropolitan counties in the early 1990's. The authors conclude that recreational areas represent important growth centers.

Power (2001) has noted higher population growth in rural counties near designated wilderness areas. During the 1990's, the growth rates for these counties continued to expand over their non-wilderness counterparts. Lorah (2000) found similar results in a study of federal wilderness, national parks, and national monuments. Additionally, the effect was enhanced in counties with no communities larger than 2,500 people. Lorah's study also noted high correlations between the percentages of county land protected and population growth. In a separate study of counties containing national parks and national monuments, Power noted that population growth over 30 years (1969-1998) was almost four times faster than the national average (2001). In fact, 82 percent exhibited above average population growth (Power 2001).

Lewis and Plantinga (2000) add further confirmation of the positive impact on population growth on lands adjacent to protected areas. The period 1990-1997 was utilized to chart the growth of rural counties near various forms of protected lands. The study described how jobs were following people's residential location decisions and took an additional step to determine if more restrictive preservation of land had a positive or negative impact on local economic conditions. The study reported that there were no such notable impacts, positive or negative, that could be tied to the level of preservation (Lewis and Plantinga 2000).

Conclusion

While this literature review may help to establish a foundation to build the critical evaluation of World Heritage, it also highlights the need for an economic evaluation of World Heritage designation. Overall, this review reveals that studies regarding the economic effects of protected lands present highly variable results. Additionally, the literature yields little in the way of comparable methodologies. The sparse literature regarding World Heritage, combined with the lack of analysis in the contemporary context (ALSPA), underscores the pertinence and timeliness of an economic evaluation of World Heritage. More specifically, a void exists in our understanding of the economic impacts of World Heritage on surrounding communities.

CHAPTER FOUR

METHODOLOGY

The methodology employed for this study incorporates the use of government-compiled economic data in two complementary statistical tests. In the briefest of terms, the goal of this study is to determine whether or not World Heritage designation positively or negatively impacts local economies by comparing two samples of counties. The first sample consists of all counties that contain and/or are adjacent to World Heritage sites. The second sample consists of counties that contain and/or are adjacent to sites identified as potential World Heritage sites.

The primary query of this investigation: "Does World Heritage inscription affect county-level economic performance?" was explored from several perspectives. First, are significant differences detectable in a coarse economic comparison of World Heritage (WH) counties and potential World Heritage (pWH) counties? The Wilcoxon rank sum test statistic allows for direct comparison, by economic sector, of the two samples. Additionally, analysis of 1972 and 1997 data allows for inferences to be made as to how the economic landscape is changing over time in the immediate vicinity of World Heritage and potential World Heritage sites.

While the Wilcoxon rank sum test statistic is effective for highlighting differences and potential changes between WH and pWH samples as a whole, it is not suited to a more focused examination of the directional changes over time exhibited within each sample. Manipulation of the Wilcoxon matched-pairs signed-ranks test statistic provides the opportunity to note the direction and magnitude of changes that have occurred

between 1972 and 1997. By utilizing both the Wilcoxon rank sum test statistic and the Wilcoxon matched-pairs signed-ranks test statistic, it is possible to paint a generalized picture of the economic environment of counties containing and adjacent to current World Heritage sites and potential World Heritage sites. SPSS version 7.5 is the statistical software that was utilized to complete the aforementioned statistical tests. Data acquisition, variable selection, and a standardization process for the samples to be tested are discussed in this chapter. Beyond this, selection of the proper test statistics, as well as test specific hypotheses, are documented and discussed here.

Data Acquisition

Data utilized for this investigation were obtained from the U.S. Census Bureau via the 2000 Census CD and the Bureau of Economic Analysis via Oregon State University's web-based Government Information Sharing Project. Data for economic variables were obtained for the years 1972 and 1997. The years 1972 and 1997 were chosen to provide two snapshots over a 25-year time period. The most contemporary dataset available was 1997 (Bureau of Economic Analysis 2001). These dates also provide the benefit of a before and after economic snapshot of counties containing and/or adjacent to designated and potential World Heritage sites. The first World Heritage sites in the Unites States (Mesa Verde and Yellowstone) were formally designated in 1978. The most recent additions were Glacier National Park and Carlsbad Caverns National Park in 1995 (Fig. 1). In order to facilitate head to head comparison, Sahr's Consumer Price Index conversion factors were utilized to adjust 1972 dollars to 1997 dollars (2001).

The aforementioned demographic and economic data were collected for all counties/administrative units that contain and/or are adjacent to all 20 designated World Heritage sites in the United States. Puerto Rico's San Juan Historic Site and La Fortalenza were not included due to a lack of comparable economic data. Additionally, data were collected for all counties/administrative units that contain and/or are adjacent to all 72 potential World Heritage sites in the U.S. This resulted in data compilation for all counties/administrative units containing and/or that share a common boundary with designated World Heritage sites (n=44). Compilation for the counties/administrative units containing and/or adjacent to potential World Heritage sites was also completed (n=68). Counties were chosen as the unit of analysis because they have historically stable boundaries and are a basic unit for reporting demographic, social, and economic data (Beale and Johnson 1998).

Data Standardization

Before proceeding with statistical testing on the respective samples of World Heritage counties/administrative units and potential World Heritage counties/administrative units, pertinent demographic data was collected for each sample. The purpose was to check that the samples were statistically similar along demographic lines. Therefore, four demographic variables were selected that provided a socioeconomic snapshot of the study counties included in each sample in terms of education, nativity, employment, and income.

The percentage of population having a high school diploma was selected as the educational attainment proxy. Educational attainment was chosen as a standardization

variable to be sure there were no outliers that would inhibit comparison of the samples. A highly educated workforce would likely display higher earning potential. This could potentially affect the types and vitality of certain industries locating in the county. Conversely, a workforce with low educational attainment could handicap the local economy and limit expansion into some industrial sectors.

Percent born in state of residence was the statistic utilized to measure nativity. The significant influences of a highly transient population on local economic dynamics have been documented (Power 1991; Reading, Clark and Kellert 1994). A low nativity percentage may be indicative of high amounts of migrant labor while a low percentage of nativity could also indicate a high percentage of retirees. This segment of the population is capable of drastically altering local economic patterns with their influx of economic capital. Anticipating that many of these counties could feel the effects of migrant labor in the tourist industry, and the effects of incoming retirees, nativity was included as a standardizing variable.

Percent unemployed provides a direct gauge of employment in the study counties. Counties with particularly high unemployment rates could indicate a variety of localized economic difficulties. Conversely, particularly robust local economies with exceedingly low unemployment rates may not be suitable for inclusion in the samples.

Median household income was selected as the indicator of income. This variable was utilized to eliminate those counties with median household incomes that were very high or very low in comparison to the sample of World Heritage counties. This variable provides the least specific standardization of the samples. A complex and varying array of variables may combine to affect a county's median household income.

Summary statistics (Table 1) were compiled for the four demographic variables within the sample of World Heritage counties (n=44). From these summary statistics, figures representing two standard deviations from the mean were derived for each variable. Counties that exceeded the established limit of two standard deviations from the mean were removed from both samples on a variable-by-variable basis.

Table 1. Demographic summary of World Heritage counties

	Med. HH Income	% Born in State	% HS Diploma	% Unemployed
Mean	$25236.42	59	72	8
Standard Deviation	$6330.13	18	11	3
Acceptable High	$37896.68	95	94	14
Acceptable Low	$12576.16	25	50	2

Table 2 displays the removed counties and variable that warranted their exclusion. Five counties were eliminated on the basis of nativity percentages that fell below the acceptable limit. Seven counties had excessively low percentages of persons with high school diplomas. Seven of the counties were disqualified because they had high unemployment rates, while Teton County in Montana was eliminated for its excessively low unemployment rate. Finally, seven counties exhibited median household income beyond two standard deviations from the mean.

It should be noted that all seven Alaska administrative units were eliminated from the samples on the basis of high median household incomes and/or high unemployment. Alaska's North Slope Borough and Yellowstone Park County, Montana were the only

observations that were eliminated for falling outside the normal population in two of the aforementioned variables.

Table 2. Demographically excluded counties

County/Administrative Unit	State	Type	Exclusionary Variable(s)
Lake and Peninsula	AK	pWH	% Unemployed
Mantunuska-Sustina	AK	pWH	Med. HH Income
North Slope	AK	pWH	% Unemployed, Med. HH Income
Northwest Arctic	AK	pWH	% Unemployed
Skagway-Yakutat-Angoon	AK	WH	Med. HH Income
Valdez-Cordova	AK	WH	Med. HH Income
Yukon-Koyukuk	AK	pWH	% Unemployed
Mohave	AZ	WH	% Born in State
Marin	CA	pWH	Med. HH Income
Collier	FL	WH	% Born in State
Clinch	GA	pWH	% HS Diploma
Maui	HI	pWH	Med. HH Income
Edmonson	KY	WH	% HS Diploma
Saint Louis	MO	pWH	Med. HH Income
Glacier	MT	WH	% Unemployed
Yellowstone	MT	WH	% Unemployed, Med HH Income, % Born in State
Esmerelda	NV	pWH	% Born in State
Nye	NV	pWH	% Born in State
Cocke	TN	WH	% HS Diploma
Hudspeth	TX	pWH	% HS Diploma
San Juan	UT	pWH	% Unemployed
Teton	WY	WH	% Unemployed

Upon completion of the standardization exercise, the sample of World Heritage counties was reduced from n=44 to n=35. Additionally, the sample of potential World Heritage counties was reduced from n=68 to n=55. Table 3 lists the counties and county

equivalents that comprise the samples upon completion of the standardization process, while Figure 5 represents the geographic distribution of these counties.

Table 3. World Heritage and potential World Heritage counties

World Heritage counties

AZ	Coconino	FL	Monroe	NC	Graham	TN	Blount
CA	Del Norte	HI	Hawaii	NC	Haywood	TN	Sevier
CA	Humboldt	ID	Fremont	NC	Swain	VA	Albemarle
CA	Madera	IL	St. Clair	NJ	Hudson	WA	Clallam
CA	Mariposa	KY	Barren	NM	Eddy	WA	Grays Harbor
CA	Mono	KY	Hart	NM	San Juan	WA	Jefferson
CA	Tuolumne	MT	Flathead	NM	Taos	WA	Mason
CO	Montezuma	MT	Gallatin	NY	Kings	WY	Park
FL	Dade	MT	Park	PA	Philadelphia		

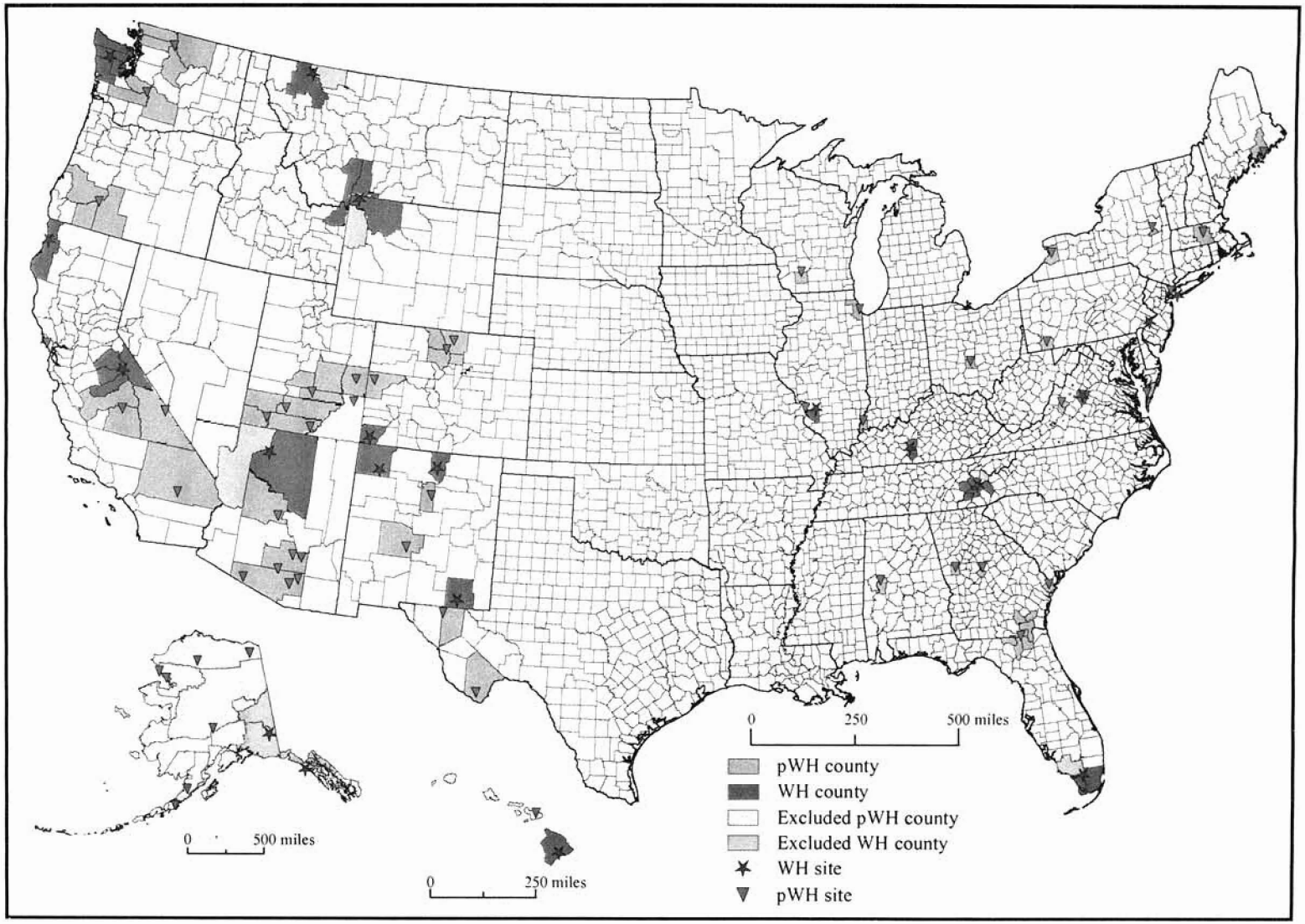
Potential World Heritage counties

AL	Hale	FL	Hamilton	NY	Schenectady	UT	Washington
AZ	Pima	GA	Bibb	OH	Pickaway	UT	Wayne
AZ	Pinal	GA	Brantley	OR	Douglas	VA	Accomack
AZ	Yavapai	GA	Charlton	OR	Jackson	VA	Northampton
CA	Fresno	GA	Chatham	OR	Klamath	VA	Rockbridge
CA	Inyo	GA	Meriwether	PA	Fayette	WA	Chelan
CA	San Bernardino	GA	Ware	TX	Brewster	WA	Lewis
CA	Tulare	IL	Cook	TX	Culberson	WA	Okanogan
CO	Boulder	IN	Posey	UT	Emery	WA	Skagit
CO	Grand	ME	Hancock	UT	Garfield	WA	Thurston
CO	Jackson	MA	Worcester	UT	Grand	WA	Whatcom
CO	Larimer	NM	Santa Fe	UT	Iron	WA	Yakima
CO	Mesa	NM	Socorro	UT	Kane	WI	Iowa
FL	Baker	NY	Erie	UT	Sevier		

Variable Selection

The selection of economic variables was guided by the availability of data with preference shown to the most contemporary, county-level data for individual industries. Data available from the Bureau of Economic Analysis fulfilled the requirements for this study.

Figure 5. Study counties.



Estimates of earnings by place of work (sector) are aggregated from the two-digit standard industrial classification (SIC) level. The principal source data for the earnings estimates are from the Bureau of Labor Statistics (BLS) ES-202 series. The ES-202 series provides monthly employment and quarterly wages for each county in four-digit SIC detail (Bureau of Economic Analysis 2001).

It is important to note that the Bureau of Economic Analysis restricts the reported income by sector to the two-digit SIC level. Even at this higher level of aggregation, information is sometimes suppressed in order to preclude the disclosure of information about individual employers. Issues of withheld economic data are pervasive below the county-level. Intact datasets with smaller geographies are not available due to the aforementioned issues of disclosure. In fact, the county-level data is not immune to these problems. Most of the industries reviewed for this study had some undisclosed county values. Due to the paired requirements of one of the test statistics chosen (see below), the impacts of these unreported values were amplified.

For completion of both the Wilcoxon rank sum test and the Wilcoxon matched-pairs signed-ranks test, the mean county loss per sector (due to undisclosed county data) for World Heritage counties was 4.33. Conversely, the mean county loss per sector for potential World Heritage counties was 7.77. This means that on average, the World Heritage sample size per sector was about 31, instead of the full complement of 35 counties. By the same token, the average sample size for potential World Heritage counties was about 47, instead of the complete sample of 55.

SIC two-digit sectors that make up the selected sectors for this comparative analysis are displayed in Table 4. These sectors were selected to provide a basis for

comparisons of World Heritage counties and potential World Heritage counties. Emphasis was placed on natural resource sectors as well as sectors related to housing and tourism.

Table 4. Standard industrial classification two-digit sectors included in aggregate economic variables

AGRICULTURAL SERVICES, FORESTRY, FISHERIES, AND OTHER	
01	Agricultural production - crops
02	Agricultural production - livestock
07	Agricultural services
08	Forestry
09	Fishing, hunting and trapping
MINING	
10	Metal mining
12	Coal mining
13	Oil and gas extraction
14	Nonmetallic minerals, except fuels
CONSTRUCTION	
15	General building contractors
16	Heavy construction contractors
17	Special trade contractors
RETAIL TRADE	
52	Building materials, hardware, garden supply, and mobile
53	General merchandise stores
54	Food stores
55	Automotive dealers and gasoline service stations
56	Apparel and accessory stores
57	Furniture, home furnishings, and equipment stores
58	Eating and drinking places
59	Miscellaneous retail
REAL ESTATE	
65	Real estate
SERVICES	
70	Hotels, rooming houses, camps and other lodging places
72	Personal services
73	Business services
75	Automotive repair, services, and parking
76	Miscellaneous repair services
78	Motion pictures
79	Amusement and recreational services
80	Health services
81	Legal services
82	Educational services
83	Social services
84	Museums, art galleries, botanical and zoological gardens
86	Membership organizations
87	Engineering and management services
88	Private households
89	Miscellaneous services
HOTELS	
70	Hotels, rooming houses, camps and other lodging places

In general, reported income for the two-digit SIC's is not available at the county level due to the aforementioned issues. Therefore, the inclusive sector classifications

must be utilized. However, hotel and lodging is one two-digit industrial sector that is available in most cases, and was subsequently analyzed independently of the services sector.

English and Bergstrom (1994) discuss the range of appropriate economic sectors for recreation site analysis. Along with Dean et al. (1978) they have focused their discussion on sectors that are affected by incoming visitors rather than by the parks themselves. From this perspective, retail sales, lodging, and services merit the focus of investigation. However, since this study seeks to obtain a measure of the effects of the park entities, a wider spectrum of sectors is addressed.

Duffy-Deno describes the continuing diversification of the county economies of the western United States (1998). He notes that while these economies were originally based on the extractive industries of grazing, lumber, and mining, other sectors have recently gained prominence. He does caution that many county economies are still closely tied to extractive industries (1998), and therefore merit inclusion in this study. Additionally, it is possible that World Heritage designation could create a supply restriction for extractive resource industries (Duffy-Deno 1998). This could invariably lead to extractive companies locating elsewhere. However, this is more likely to be the case for new operations as opposed to existing ones. Firms in extractive sectors such as agricultural services, farming, and mining are not very mobile, as they are tied to the locations of the exploitable resources (Duffy-Deno 1997).

Agriculture services, forestry and fisheries are all natural resource related sectors. How have these sectors fared in the 25-plus years since World Heritage inception? Farming was included as a natural resource sector. Farmers undoubtedly face varying

degrees of regulation in different locations. Farming and mining sectors have experienced more pervasive declines in recreational counties across the U.S. as the shift is made to a service-based economy (Beale and Johnson 1998). Mining was a particularly important choice to include in the analysis given that much of the debate concerning perceived economic impacts of World Heritage has focused on a mine.

Construction, real estate, retail sales, hotels, and services are sectors traditionally associated with analysis of park and visitor impacts (Dean et al. 1978; English and Bergstrom 1994). Construction values might reflect increasing numbers of individuals and businesses that seek to locate near amenity resources (Beale and Johnson 2001). These values may have a greater regional variation than other sectors due to increased settlement of pristine areas of the West. Additionally, the construction sector benefits from the additional infrastructure and housing needs associated with large transient populations inherent to economies with a significant tourism component.

The real estate sector may be closely associated with the construction sector, therefore strengthening the findings of this study. The real estate sector could potentially benefit from the existence of nearby World Heritage areas. World Heritage could enhance the attractiveness of the region as a place to live and do business. In some cases, well-educated and well-trained people are willing to trade a higher quality of life for a lower income in moving to such areas (Duffy-Deno 1998). Additionally, incoming retirees are a likely source of stimulation for both the real estate and construction sectors (Beale and Johnson 1998).

Retail sales can be an important benefit associated with tourism. With increasing development of a tourist industry, one would expect retail sales to grow. However, hotels

and other forms of lodging are likely the best measure of tourism in this group of selected sectors. Visitors to recreation areas require temporary lodging in close proximity to nearby recreation destinations (Beale and Johnson 1998). A significant increase in hotel income would suggest a positive effect of World Heritage designation from a tourism perspective.

Services include a host of minor sectors such as auto repair shops and amusement and recreation services that are directly linked to the tourist trade. The service sector has been identified as a primary component of counties with strong dependence on recreational activity (Beale and Johnson 1998). Firms from this sector may also be attracted to World Heritage areas to make use of the well-educated employee base mentioned above. If World Heritage has stimulated or stymied a transition for the local economy, the expectation is that this sector would provide evidence.

Total personal income is the all-inclusive economic measure with this group of statistics. It contains the aforementioned sectors, as well as the remainder of the sectors comprising total economic earnings for each county. In the case of total personal income, the effects of World Heritage should be mixed. Any negative effect of World Heritage on employment in extractive industries "...may be partially, exactly, or more than offset by employment gains in non-extractive industries" (Duffy-Deno 1998, p. 115).

And finally, population change was analyzed as a proxy measure of the overall economic climate. Duffy-Deno (1998) utilized population in this fashion for a study regarding economic impacts of federal wilderness. Noteworthy trends and variations in population were noted for the 25-year interval of this study.

Test Statistic Selection

Selection of the most appropriate test statistic(s) was an essential step. The newly refined datasets present several unique challenges. First and foremost, data for the respective sectors is non-normally distributed. Additionally, the sample size is particularly small ($n < 30$) for several of the sectors examined. Accounting for these two issues is imperative in the test statistic selection process.

Beyond these considerations, it is important to select the best test(s) to identify differences between the respective samples of World Heritage counties and potential World Heritage counties, as well as changes that occur by county over the designated temporal period. This can be achieved by using a two-fold approach. One test stresses a sector-by-sector comparison of World Heritage and potential World Heritage counties while the other emphasizes change in economic performance over time by county, and for the respective samples as a whole. This multi-faceted approach provides a broad collection of results that illuminate the economic environment in World Heritage and potential World Heritage counties.

Wilcoxon Rank Sum Test Statistic

In a general sense, the goal of the first test is to determine if any significant differences exist between the two samples. If the differences prove to be significant, statistical inference warrants a conclusion that the samples are drawn from two different samples. However, if no significant differences are found then it may be inferred that the two samples were drawn from the same population. In this case, the goal is to determine if the WH counties are outperforming or underperforming their pWH counterparts when

the two samples are compared on a sector-by-sector basis. This objective guides the test selection toward a two-sample difference of means test.

In this case, however, the two-sample difference of means test (Z or t) is not appropriate due to the non-normal distribution of the data. McGrew and Monroe (2000) outline the correct procedure in cases such as this:

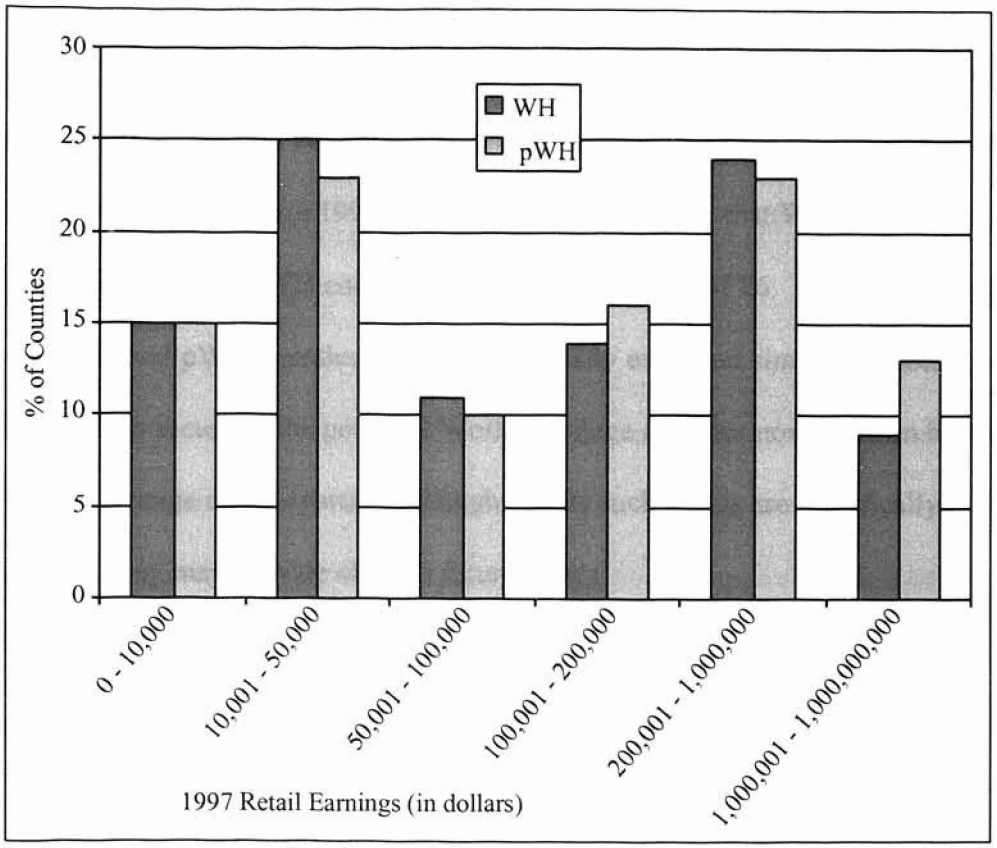
> When samples exhibit moderate to severe deviation from normality, the use of a difference of means test raises serious questions about the validity of such a parametric procedure. In these cases, a nonparametric test for two independent samples is a better alternative (p.133).

The Wilcoxon rank sum W statistic is the most widely used two-sample difference of means test in these situations (McGrew and Monroe 2000). This test uses the ranks of sample observations to measure the magnitude of the differences in the ranked positions or locations between the two sets of sample data. It should be noted that it is necessary for data to be measured at, or downgraded to, the ordinal level for the Wilcoxon rank sum test statistic. The procedure also requires that the two distributions, while not normal, have a similar distribution. Figure 6 displays a set of representative distributions for the paired economic variables. In the Wilcoxon rank sum test, data corresponding to the two samples are combined and placed in a single ranked set. In this case, the two sets refer to the World Heritage counties and potential World Heritage counties. A single ranked set is created for each sector.

The samples are then considered separately and the sum of ranks is calculated for each sample. The Wilcoxon rank sum statistic (W) is the value of the sum of ranks of the group with the smaller sample size. To clarify, the World Heritage counties sample is the smaller sample in this investigation. The Wilcoxon rank sum test statistic always

provides the same significance level (p-value) when applied to the same set of data (McGrew and Monroe 2000). The Wilcoxon rank sum test statistic is displayed in Figure 10.

Figure 6. Representative distributions for paired economic variables.



Because the sample sizes are not equal in this investigation, the respective sum of ranks should be proportional to the respective sample sizes if the samples were taken from the same sample. In this case, the findings would confirm the null hypothesis of no significant difference between the two samples. However, if the sum of ranks for the first sample is quite different (after accounting for the proportionally different sample sizes) from the sum of ranks for the second sample, it is more likely that the two samples have

been drawn from different samples. This would encourage confirmation of the test specific alternative hypothesis that there are significant differences between the two samples.

Beyond the returned *p*-value, the mean ranks for each sample are worthy of review. This is particularly true when the significance level cannot confirm that the samples were drawn from the same sample. For example, in 1972 sector X may have a mean ranking of 31 for WH counties, and a mean ranking of 29 for pWH counties. If the same sector is reviewed using 1997 data, it may be discovered that WH counties exhibit a mean ranking of 34, and pWH counties have a mean ranking of 26. This would suggest that while WH and pWH counties may have originally exhibited similar economic characteristics in sector X, the potential World Heritage counties now perform better than their World Heritage counterparts. Although results such as this are statistically inconclusive, they may provide clues to future trends.

Figure 7. Wilcoxon rank sum test statistic.

$$Z_W = \frac{W_i - W_i}{s_W}$$

where W_i = sum of ranks for sample i

W_i = mean rank of $W_i = n_i\left(\frac{n_1 + n_2 + 1}{2}\right)$

s_W = standard deviation of W

H_O: $\mu_1 = \mu_2$

H_A: $\mu_1 \neq \mu_2$

Utilization of the aforementioned Wilcoxon test statistic should provide an indication of the economic effects of World Heritage designation. Beyond this, it would

be useful to know if particular industries displayed enhanced performance in either of the samples. This requires a matched-pairs difference test.

Wilcoxon Matched-Pairs Signed-Ranks Test Statistic

The Wilcoxon matched-pairs signed-ranks test is a nonparametric method that can use interval/ratio data downgraded to its ordinal equivalent. In cases where a matched-pairs test is appropriate, but the sample data is drawn from a non-normally distributed population, the Wilcoxon matched-pairs signed-ranks test is the appropriate procedure (McGrew and Monroe 2000).

The Wilcoxon matched-pairs signed-ranks test uses matched-pair differences ranked from lowest to highest. The absolute differences between the two variables are used to determine the rank for each matched pair. The null hypothesis states that the matched-pairs differences (in ranks) are equal for the population from which the sample is drawn.

Two sums can be calculated from the set of matched pairs: T_p, the sum of ranks for positive differences, and T_n, the sum of ranks for negative differences. If the sum of ranks for positive differences and the sum of ranks for negative differences are approximately equal, the two variables measured for the single sample have little difference. However, if the differences are large between the variables, there will also be a large disparity between the respective sums of ranks (McGrew and Monroe 2000).

In this case, the two-tailed test is applied. This test is focused on identifying a difference between the two variables under study and not which one is largest. The two-tailed test was chosen in anticipation that some sectors would exhibit negative growth

while others would exhibit positive growth. Because more than 10 pairs are utilized in all of the sectors tested for both the WH and pWH samples, the rank sum (T) can be converted to a Z statistic and tested using the distribution of normal values (McGrew and Monroe 2000).

Figure 8. Wilcoxon matched-pairs signed-ranks test statistic.

$$Z_{W} = \frac{T - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

where n = number of matched pairs ($n > 10$)
T = rank sum

H_O: The ranked matched-pair differences of the samples are equal.
H_A: The ranked matched-pair differences of the samples are not equal.

Sector performance for 1972 and 1997 are the variable pairs used. The test statistic is calculated for each sector for both the World Heritage counties sample and the potential World Heritage counties sample. For this study, the null hypothesis would be rejected if there were changes in economic performance by sector from 1972 to 1997. The null hypothesis for this test statistic is likely to be rejected, as non-contemporaneous economic data is compared in this study.

A non-traditional use of the test statistic is more appropriate for this study. The information to be gleaned is found through the study of the magnitude of change by sector when comparing the two samples. In other words, are industries in either of the samples showing more substantial directional change? A second parallel set of hypotheses is required under these circumstances.

H_O: The proportionate negative sum of ranks of *both* samples is equal.
H_A: The proportionate negative sum of ranks of *both* samples is not equal.

The testing of these hypotheses requires two simple calculations to determine a proportion of negative to positive ranks (negative ratio), and the proportion of the negative sum of ranks to the positive sum of ranks (sum of ranks ratio). Additional calculations facilitate sample comparison. A determination of these figures is obtained by the calculations presented in Figure 9.

Figure 9. Supplementary data calculations.

$$\text{Negative ratio (NR)} = \frac{n \text{ of negative ranks}}{n \text{ of positive ranks}}$$

$$\text{Sum of ranks ratio (SRR)} = \frac{\text{sum of negative ranks}}{\text{sum of positive ranks}}$$

NR difference = WH NR - pWH NR

SRR difference = SRR - NR

This extension and adaptation of the Wilcoxon matched-pairs signed-ranks test results in a series of proportional figures that provide a basis for contrast and comparison. The rejection of the null hypothesis in effect states that either the WH counties sample or the pWH counties sample has shown more proportional economic improvement than its counterpart.

Differentiations can be made between the negative ratio (NR) and the related NR difference, the sum of ranks ratio (SRR) and its corollary, the SRR difference. The NR reports the ratio of counties in a sample that experienced negative growth over the period

1972 to 1997. There is no measure of the magnitude of negative growth in this figure; it simply accounts for positive or negative growth of any scale to produce a negative growth ratio figure. NR's greater than 1 indicate more counties experienced negative growth than positive growth over the study period. On the other hand, NR's less than 1 show that more counties experienced positive growth than negative growth. The figures are noteworthy in and of themselves; however, they are more valuable to this study when results for WH counties and pWH counties are placed in direct comparison. The NR difference provides this comparison. This figure highlights sectors that displayed noteworthy discrepancies in negative ratios between the two samples. When the NR difference is a negative number it indicates that the World Heritage sample had a greater percentage of its counties experiencing positive growth than the their potential World Heritage counterparts. A positive value in the NR difference column indicates that the pWH sample has a greater percentage of counties with positive growth than the WH sample.

Beyond the NR, the SRR accounts for the weight of the ranks of the observations. By dividing the negative sum of ranks by the positive sum of ranks, this measure can highlight unexpected sample distributions. Sectors where the minority ranks are clustered toward the top or bottom of the distribution are illuminated. For instance, a sector may only have three negative observations for the study period, however they may be the largest changes in the sample. In this case, the SRR value will be higher than the NR value. If on the other hand, those three negative observations are clustered as the smallest changes in the sample, the SRR will be lower than the NR value. The SRR difference highlights these disparities. For example, the proportion of the negative sum

of ranks to the positive sum of ranks for economic sector X for WH counties is 0.2. On the other hand, the proportion of the negative sum of ranks to the positive sum of ranks for economic sector X for pWH counties is 0.5. The lower proportionate number displayed by WH counties in this example indicates that a smaller percentage of WH counties experienced negative growth than their pWH counterparts.

To elaborate, the lowest rank (1) is assigned to the 1972 to 1997 county change that is smallest and the highest rank (ranging from 23 to 55) is assigned to the 1972 to 1997 county change that is largest. If sector X for WH counties had 11 negative ranks and 19 positive ranks, the results could vary immensely. If the 11 negative ranks were the first through eleventh, it would indicate that 11 counties lost ground economically from 1972 to 1997, but that they were the 11 smallest changes. Subsequently, their mean rank would be 6, and the sum of ranks would be 66. If, on the other hand those 11 ranks were the 11 highest it would create a very high mean ranking of 26.81, and a sum of ranks of 295. The NR and SRR figures are useful in making distinctions between proportional negative growth and the magnitude of economic decline.

Conclusion

In summary, samples were compiled and subsequently standardized for counties adjacent to, and/or containing World Heritage sites, and for counties adjacent to, and/or containing potential World Heritage sites. An analysis of demographic data was utilized to standardize the respective samples. Counties from both samples with demographic observations that are greater or less than two standard deviations from the mean of the World Heritage sample were excluded.

Bureau of Economic Information data was utilized to provide earnings by sector for the sample counties. The selected economic variables were obtained for 1972 and 1997. 1972 data provides a baseline prior to the inception of World Heritage in the United States while 1997 data represents the most contemporary data available at the needed resolution. Population figures for sample counties were obtained from the 2000 Census CD. These datasets were utilized to complete the Wilcoxon rank sum test and the Wilcoxon matched-pairs signed-ranks test.

The Wilcoxon rank sum test allows head to head comparison of the samples by sector. The test statistic helps to determine whether the two samples have been drawn from the same population. An additional statistical measure is the Wilcoxon matched-pairs signed ranks test. Elements of this test were utilized to highlight particular industries of the samples that have displayed growth or atrophy over the study period. Results are displayed and discussed in the following chapter.

CHAPTER FIVE

FINDINGS AND DISCUSSION

A collection of measures for the evaluation of economic vitality was utilized to compare and contrast World Heritage and potential World Heritage counties. The Wilcoxon rank sum test statistic and the Wilcoxon matched-pairs signed-rank test statistic are suited to the unique characteristics involved in the analysis of economic and population data, helping to illuminate economic impacts tied to World Heritage, as well as to paint the big picture of the economic context in which these sites exist. Reviews of percentage change by economic sector, discussion of proportional changes occurring within sectors, and broader contextual description and analysis provide further insight on the World Heritage economic milieu.

Wilcoxon Rank Sum Test Statistic

The Wilcoxon rank sum test statistic is the nonparametric test best suited to evaluating two independent samples. In this case, the two independent samples were a collection of 35 World Heritage (WH) counties and 55 potential World Heritage (pWH) counties. The direct comparison of the WH sample and pWH sample on an economic sector-by-sector basis was the primary objective.

The null hypothesis for the Wilcoxon rank sum test statistic implied that the respective samples of World Heritage counties and potential World Heritage counties were drawn from the same population, and subsequently the distribution of measurements

for the WH sample was equal to that of the pWH sample. Conversely, the alternative hypothesis states that the distribution of measurements for the WH sample is not equal to that of the pWH sample (Fig. 7). In other words, this test seeks to ascertain if, for example, the sample of WH counties was significantly outperformed by the sample of pWH counties in the mining sector.

Findings

Upon review of the two tailed *p*-values obtained from this test, the null hypothesis was not rejected. In eight of eight economic sectors (plus total personal income) comparisons, the *p*-value indicated that the varied sectors were not different enough to be statistically significant (at the .05 level). This held true when testing both the 1972 and 1997 figures. The test statistic confirms that World Heritage counties and potential World Heritage counties are economically similar in the sectors tested. Table 5 displays the pertinent values obtained from the Wilcoxon rank sum test.

While statistically significant values that would suggest that the respective samples were drawn from different populations were not provided by the Wilcoxon rank sum test, there are several noteworthy points. The mining sector exhibited the greatest change in *p*-value. The 1972 *p*-value was second lowest (.157) and the 1997 *p*-value was second highest (.946), indicating a shift from relatively dissimilar samples to relatively similar samples. It should be noted, however, that this sector has the lowest number of observations for both the WH sample (23) and the pWH sample (32). The particularly small samples would make this sector more susceptible to large changes in *p*-value. With remarkably similar values across the samples, construction and services were the two

sectors that the Wilcoxon rank sum test indicated as having a greater than 90 percent chance that the two samples were drawn from the same population for both the 1972 and 1997 data sets. The all-inclusive measure of total personal income displayed high *p*-values (.801, .700) as well, for 1972 and 1997.

Table 5. Wilcoxon rank sum test summary

Industry	Year	Type	N	Mean Rank	Sum of Ranks	P-Value (2-tailed)	Null Hypothesis
Agricultural services, forestry, and fisheries	72	WH	26	28.79	748.5	.402	Reject
	72	pWH	35	32.64	1142.5		
	97	WH	26	29.92	778	.683	Reject
	97	pWH	35	31.80	1113		
Construction	72	WH	34	42.94	1460	.986	Reject
	72	pWH	51	43.04	2195		
	97	WH	34	42.68	1451	.921	Reject
	97	pWH	51	43.22	2204		
Farming	72	WH	34	41.35	1406	.295	Reject
	72	pWH	55	47.25	2599		
	97	WH	34	41.94	1426	.380	Reject
	97	pWH	55	46.89	2579		
Hotels and other lodging places	72	WH	24	36.38	873	.137	Reject
	72	pWH	39	29.31	1143		
	97	WH	24	33.54	805	.601	Reject
	97	pWH	39	31.05	1211		
Mining	72	WH	23	24.39	561	.157	Reject
	72	pWH	32	30.59	979		
	97	WH	23	27.83	640	.946	Reject
	97	pWH	32	28.13	900		
Real estate	72	WH	30	36.77	1103	.809	Reject
	72	pWH	44	38.00	1672		
	97	WH	30	37.00	1110	.869	Reject
	97	pWH	44	37.84	1665		
Retail sales	72	WH	35	46.06	1612	.756	Reject
	72	pWH	54	44.31	2393		
	97	WH	35	46.60	1631	.638	Reject
	97	pWH	54	43.96	2374		
Services	72	WH	35	42.89	1501	.972	Reject
	72	pWH	50	43.08	2154		
	97	WH	35	42.77	1497	.943	Reject
	97	pWH	50	43.16	2158		
Total personal income	72	WH	35	46.37	1623	.801	Reject
	72	pWH	55	44.95	2472		
	97	WH	35	46.83	1639	.700	Reject
	97	pWH	55	44.65	2456		

Wilcoxon Matched-Pairs Signed-Ranks Test Statistic

As discussed in chapter 4, the Wilcoxon matched-pairs signed-ranks test is used when a matched-pairs test is appropriate and the data exhibits a non-normal distribution. Due to the 25-year gap between the datasets, most economic sectors exhibit substantial economic growth resulting in rejection of the null hypothesis (the ranked matched-pair differences of the samples are equal). Only in cases of no definable economic trend is the null hypothesis not rejected. For example, half of the counties in a sector display positive growth over the study period, while the other half display negative growth. Additionally, a sector displaying no changes from 1972 to 1997 allows the null hypothesis to be accepted. Due to the improbability of these scenarios, an alternative means of evaluating the test results was devised.

Simple calculations can provide additional figures to compare WH and pWH samples (Figure 9). The resultant supplementary figures are the negative ratio (NR), the negative ratio difference, the sum of ranks ratio (SRR), and the sum of ranks ratio difference. The purpose of these additional figures is to shed light on the frequency and magnitude of directional change within the samples. For example, these figures highlight economic sectors where negative trends over the study period were both numerous and substantial (pWH farming), as well as sectors where the frequency of negative change was similar (mining), but the magnitude of these changes was notably different. To facilitate comparative analysis, Sahr's Consumer Price Index conversion factors were utilized to adjust 1972 dollars to 1997 dollars (2001).

Findings

As expected, the null hypothesis for the Wilcoxon matched-pairs signed-ranks test was rejected for most sectors (Table 6). Due to mixed economic results, the mining sector for WH counties and pWH counties fell outside the acceptable .05 limit for the test leading to a failure to reject the null hypothesis in only these two instances. The farming sector is noteworthy in that that it was the only sector with dominant negative growth. Because both samples exhibited across-the-board economic decline in this sector, the null hypothesis was rejected for both samples. Given that a wholesale rejection of the null hypotheses was anticipated, it is here that the supplementary data provides additional insight (Table 7).

Agricultural services, forestry, and fisheries. The negative ratio for WH counties was .130 compared to .250 for potential World Heritage counties. However, the lower SRR's exhibited by both samples indicate that the negative changes were not substantial as a whole. Washington State counties accounted for a disproportionate number of the counties (four of ten) exhibiting negative growth in the two samples. Additionally, the Washington counties experienced the largest negative growth during the study period.

Farming. The farming sector is noteworthy because of its overwhelmingly negative trend. The respective NR's of 4.167 (WH) and 5.111 (pWH) reveal that greater than 75 percent of the counties experienced negative growth over the study period. The two samples can be more effectively differentiated by the SRR. The pWH SRR of 10.0 indicates that the negative changes within the sample were not only numerous, but quite large. A few of the noteworthy examples include Mesa Co, CO with an 87 percent drop over the study period and Iowa Co, WI with a 107 percent decrease in farm earnings.

While the WH SRR is substantially lower at 2.791, this figure is the second highest SRR recorded. Although WH losses in the farming sector were of a lesser magnitude, Tuolumne Co, CA experienced a staggering 191 percent decrease in farm earnings.

Table 6. Wilcoxon matched-pairs signed-ranks test summary.

Industry	Period	Type	+/- Ranks	N	Mean Rank	Sum of Ranks	P-Value
Agricultural services, forestry, and fisheries	72-97	WH	Neg	3	12.00	36	.000
			Pos	23	13.70	315	
	72-97	pWH	Neg	7	14.14	99	.000
			Pos	28	18.96	531	
Construction	72-97	WH	Neg	7	23.86	167	.026
			Pos	27	15.85	428	
	72-97	pWH	Neg	11	22.27	245	.000
			Pos	40	27.02	1081	
Farming	72-97	WH	Neg	25	15.24	321	.009
			Pos	6	19.17	115	
	72-97	pWH	Neg	46	30.43	1400	.000
			Pos	9	15.56	140	
Hotels and other lodging places	72-97	WH	Neg	5	6.20	31	.001
			Pos	19	14.16	269	
	72-97	pWH	Neg	3	4.00	12	.000
			Pos	36	21.33	768	
Mining	72-97	WH	Neg	10	11.3	113	.447
			Pos	13	12.54	163	
	72-97	pWH	Neg	20	16.35	327	.052
			Pos	10	13.80	138	
Real estate	72-97	WH	Neg	3	14.67	44	.000
			Pos	27	15.59	421	
	72-97	pWH	Neg	3	16.00	48	.000
			Pos	41	22.98	942	
Retail sales	72-97	WH	Neg	3	24.00	72	.000
			Pos	32	17.44	558	
	72-97	pWH	Neg	9	19.33	174	.000
			Pos	45	29.13	1311	
Services	72-97	WH	Neg	0	0.00	0	.000
			Pos	35	18.00	630	
	72-97	pWH	Neg	1	2.00	2	.000
			Pos	49	25.98	1273	
Total personal income	72-97	WH	Neg	1	27.00	27	.000
			Pos	34	17.74	603	
	72-97	pWH	Neg	1	2.00	2	.000
			Pos	54	28.48	1538	

Mining. The mining sector displayed the largest discrepancy between the samples. In World Heritage counties, cases of positive growth slightly outnumbered those of negative growth, for an NR value of .769. An NR value of 2.0 for pWH counties indicates that negative growth in mining was predominant.

Table 7. Wilcoxon matched-pairs signed-ranks test supplementary data

Industry	Period	Type	NR	NR Diff	SRR	SRR Diff
Agricultural services, forestry, and fisheries	72-97	WH	.130	-.120	.114	-.016
	72-97	pWH	.250		.186	-.064
Construction	72-97	WH	.259	-.016	.390	.131
	72-97	pWH	.275		.227	-.048
Farming	72-97	WH	4.167	-.944	2.791	-1.376
	72-97	pWH	5.111		10.000	4.889
Hotels and other lodging places	72-97	WH	.263	.180	.115	-.148
	72-97	pWH	.083		.016	-.067
Mining	72-97	WH	.769	-1.231	.693	-.076
	72-97	pWH	2.000		2.370	.370
Real estate	72-97	WH	.111	.038	.105	-.006
	72-97	pWH	.073		.051	-.022
Retail sales	72-97	WH	.094	-.106	.129	.033
	72-97	pWH	.200		.133	-.067
Services	72-97	WH	.000	-.020	.000	.000
	72-97	pWH	.020		.002	-.018
Total personal income	72-97	WH	.029	.011	.045	.016
	72-97	pWH	.019		.001	-.018

A statewide trend revealed itself in viewing the samples together, six of eight Washington counties experienced positive growth in the mining sector while five of six California counties experienced negative growth. Interestingly, counties included in the WH sample that were adjacent to Yellowstone National Park recorded positive growth in the mining sector. SRR's for the two samples enhance the NR values. The WH SRR was .076 lower than the NR, while the pWH SRR registers a value .370 higher than its respective NR. This indicates that the negative WH observations are cumulatively smaller changes compared to the counties exhibiting positive growth. On the other hand, the pWH negative changes had a mean rank of 16.35 compared to the positive mean rank of 13.8. Recall that higher numbered ranks represent larger changes in this test, indicating that mining in the pWH sample exhibited counties with negative changes that were on average larger than those with positive changes.

Construction. This sector displayed the smallest negative ratio difference between the two samples. While there was little discrepancy between the NR values, the SRR values provided more contrast. Due to the pWH sample's much higher positive mean rank of 27.02, its SRR value is .227. This is in comparison to the WH sample's SRR of .390 with its correlated mean positive rank of 15.85. These figures suggest that construction in WH counties grew at a greater rate than the pWH counterparts in the counties displaying positive growth. The WH sample displayed some dramatic economic strides in the construction sector. For example, San Juan Co, NM, Sevier Co, TN, and Mason Co, WA all exhibited construction growth exceeding 300 percent. Whereas, the biggest WH construction loser was Fremont Co, ID (77%) while Okanogan Co, WA (65%) earned that distinction from the pWH sample.

Hotels and other lodging places. Economic performance in this sector was strong for both samples. The pWH sample had fewer counties with negative growth and subsequently a lower NR (.083) than the WH sample (.263). However, the WH SRR is markedly lower (.115) than its NR suggesting that while the negative changes were relatively frequent, they were not particularly sizable. The one notable WH county drop (44%) in hotel revenue occurred in highly urbanized Kings Co, New York. A lack of sizable negative change in the pWH sample accounts for the very low SRR (.016). On the other hand, there were significant positive changes throughout both samples. This includes WH positive gains in Clallam Co, WA and Hawaii Co, HA approaching 250 percent as well as pWH counties Yavapai Co, AZ and Washington Co, UT approaching 450 percent.

Real estate. This sector witnessed wholesale growth in both samples with only small discrepancies between respective NR's and SRR's. Three negative growth values were present in both the WH and pWH samples. Saint Clair Co, IL experienced the most notable decrease (43%) in real estate earnings amongst WH counties while Brewster Co, TX had the most significant percentage decrease (70%) in real estate earnings for the pWH sample. Exceptional growth in real estate earnings was found in the WH counties of Hawaii Co, HI (493%), Flathead Co, MT (514%), and Taos Co, NM (313%) and the pWH counties of San Bernadino Co, CA (587%), Grand Co, CO (1235%), Santa Fe Co, NM (401%), and Washington Co, UT (1807%).

Retail sales. The respective samples exhibited similar SRR's for the retail sales sector, however the WH sample had a notably lower NR (.094) with only 3 of 35 observations displaying a negative trend. In comparison, the pWH sample had 9 of 54

observations displaying negative retail sales growth. The gap in NR values (-.106) is diminished in the SRR values as a result of two of the three WH negative values representing the two highest ranks (changes) in the sample. Kings Co, NY and Philadelphia Co, PA both recorded declines in retail earnings exceeding 50 percent. Considering that these counties represented two of the three largest retail sales economies in the sample, their notable gross change dictates the highest rankings for these observations. The pWH sample presented a mixture of large urban economies and smaller rural counterparts to constitute its negative rankings. For instance, Cook Co, IL experienced a nearly $100 million decline that represented a 14 percent drop from 1972 to 1997. Culberson Co, TX witnessed a 53 percent decline that was closer to a $4 million decrease from 1972 retail sales earnings. In the aforementioned cases, Cook County registers as the highest rank in the Wilcoxon matched-pairs signed ranks test while the change in Culberson Co, TX is assigned a much lower rank.

Services. All observations but one (Culberson Co, TX) showed positive growth in the services sector over the study period. Culberson County's change was the second smallest among pWH counties, leading to the .002 SRR.

Total personal income. Total personal income (TPI) also displayed overwhelmingly positive growth. Exceptions to this trend are found in Philadelphia Co, PA within the WH sample and with Culberson Co, TX within the pWH sample. The WH sample's higher SRR (.045) is a result of the nearly $1 billion decrease in TPI for Philadelphia County compared to the $14 million decrease for Culberson County.

Population Change

An analysis of population change for the respective samples is another proxy of overall economic influence exerted by World Heritage designation. The Wilcoxon rank sum test indicates that little change has occurred from 1972 to 1997 when the two samples are combined into a ranked set (Table 8).

Table 8. Wilcoxon rank sum test, population change

	Year	Type	N	Mean Rank	Sum of Ranks	P-Value (2-tailed)
Population	72	WH	35	46.09	1613	.865
	72	pWH	55	45.13	2482	
	97	WH	35	46.43	1625	.788
	97	pWH	55	44.91	2470	

The Wilcoxon matched-pairs signed-ranks test (Table 9) and supplementary data (Table 10) illuminate differences between the two samples. While the negative ratio figures are quite similar, the sums of ranks ratios display notable differentiation. Although both samples share similar proportions of counties that experienced a decline in population, the WH counties' population declines were some of the largest changes noted. Whereas, the negative pWH population shifts were more evenly distributed (small and large changes) throughout the sample.

Table 9. Wilcoxon matched-pairs signed-ranks test, population change

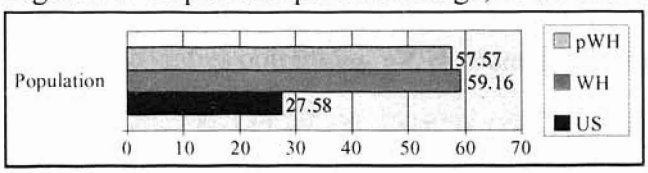
	Period	Type	+/- Ranks	N	Mean Rank	Sum of Ranks	P-Value
Population	72-97	WH	Neg	4	28.50	114	.001
			Pos	31	16.65	516	
	72-97	pWH	Neg	7	25.71	180	.000
			Pos	48	28.33	1360	

Table 10. Wilcoxon matched-pairs signed-ranks test supplementary data, population change

	Period	Type	NR	NR Diff	SRR	SRR Diff
Population	72-97	WH	.129	-.016	.220	.091
	72-97	pWH	.145		.132	-.013

Figure 10, provides the most compelling information regarding population change. World Heritage and potential World Heritage counties' populations grew at approximately double the rate of the US population as a whole. This information suggests that the counties are popular migration destinations.

Figure 10. Population percent change, 1972-1997.



Discussion

As stated, the Wilcoxon rank sum test is successful in confirming that there are no statistically significant differences between selected sector performance in World Heritage and potential World Heritage counties. The sector (1972 hotels and other lodging places) that exhibited the greatest dissimilarity registered a *p*-value (.137) that far surpassed the .05 significance level. However, there is more to be gleaned from the comparison of samples utilized for the Wilcoxon rank sum test. For instance, which industries were most similar and which industries exhibited the greatest change between 1972 and 1997? To answer these questions, an examination of the individual components

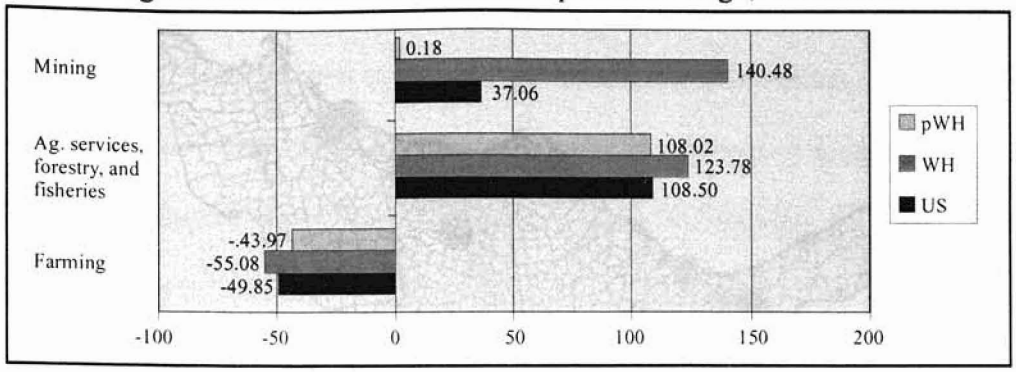
of the rank sum test (mean ranks, sum of ranks, and *p-values*) combined with a review of percentage change by sector (Figures 10 and 11) is helpful. In the absence of statistically significant *p*-values, this methodology allows for a degree of inferred analysis.

Albeit not at a statistically significant level, those sectors identified as natural resource-related (agriculture, farming, and mining) performed better (lower mean ranks and lower sums of ranks) in WH counties (Table 5). However, it can be noted that *p-values* for comparison of agricultural services, farming, and mining sectors increased from 1972 to 1997, possibly indicating that the samples were becoming more similar.

On the other hand, construction, retail, services, and total personal income sectors may be becoming less similar as indicated by growing disparities in mean ranks and sum of ranks between samples. Upon review of mean rank figures, performance for these sectors was mixed with WH counties outranking pWH counties in construction and services, while the pWH counties fared better in retail and total personal income. However, it should be reemphasized that the results provided by the Wilcoxon rank sum were not statistically significant.

In light of this, it is helpful to introduce another comparative measure for the two samples. Illustrations of percentage change by sector provide a broad comparison between the respective samples and national averages over the study period. Percentage change by sector was determined by calculating the mean percentage change for the 35 observations of the WH sample and the 55 observations of the pWH sample. Figures 11 and 12 group the sectors into natural resource and housing and tourism clusters.

Figure 11. Natural resource sectors percent change, 1972-1997.



Growth in the mining sector of WH counties is particularly noteworthy. Amidst the controversy of the New World Mine, the mining sector has grown at three times the national rate in counties containing or adjacent to World Heritage sites. Figure 12 displays percentage change in the mining sector in both pWH and WH counties. Note that eight of eleven counties reporting an increase in mining revenues of greater than 100 percent for the study period are World Heritage counties. Additionally, an east-west dichotomy is evident. The majority of counties that have made positive gains in the mining sector are found in the western half of the country.

WH counties have also experienced more growth in the agricultural services sector, albeit a more modest advantage. On the other hand, WH and pWH samples in the farming sector bracketed national averages over the study period with WH counties experiencing slightly higher percentage losses than the national average.

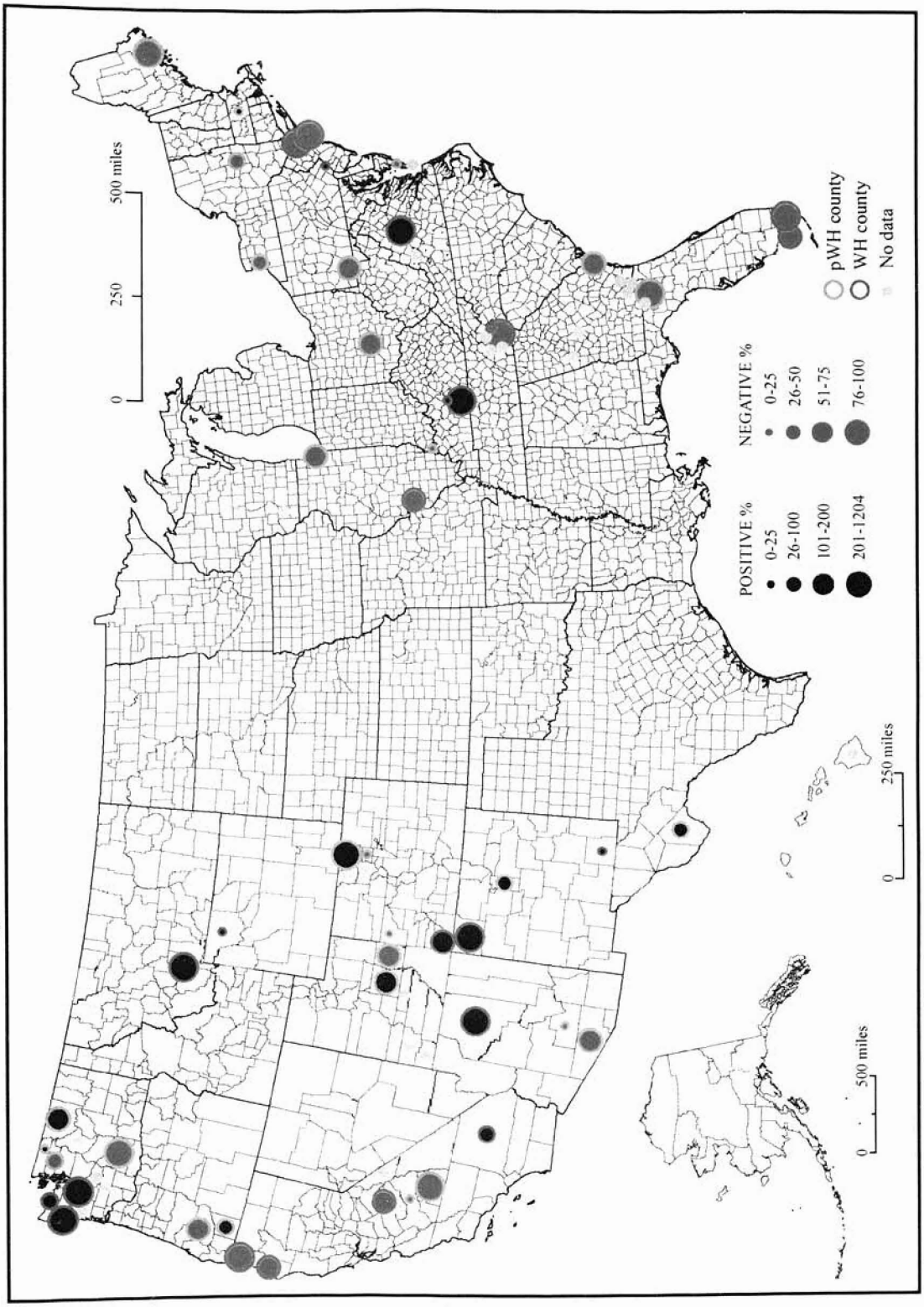


Figure 12. Mining sector percentage change, 1972-1997.

It is unlikely that the designation of World Heritage sites is largely responsible for advantages held by the WH sample in two of three natural resource sectors. A more likely explanation lies in the uneven distribution of cultural and natural designations in the representative samples of counties. In comparison to pWH counties, a disproportionate number of counties that surround sites designated for their natural rather than cultural values are included in the WH sample (Table 11). World Heritage natural sites are more likely to be located in sparsely populated, rural locations that are conducive to economic development in the natural resource sectors. On the other hand, the pWH sample contains many more counties surrounding culturally significant sites. These sites are more likely to have more densely settled land and an urban economy.

Table 11. County type

	N	**Cultural**	**Natural**
WH	35	7	28
pWH	55	23	32

Within the housing and tourism sectors, percentage change statistics (Figure 13) indicate that both samples are generally outpacing the national average. This trend is most notable in the construction, real estate, and retail sectors. The growth of the West and the counter-urbanization trend experienced in the U.S. has influenced these statistics. Extraordinary growth witnessed by some western counties in these economic sectors has raised the mean percentage for the WH and pWH samples to levels that outpace the U.S. as a whole. Even with the recent national economic downturn that began in 2000, a visit

to the intermountain West reveals vigorous construction of new homes, condominiums, and businesses.

Figure 13. Housing and tourism sectors percent change, 1972-1997.

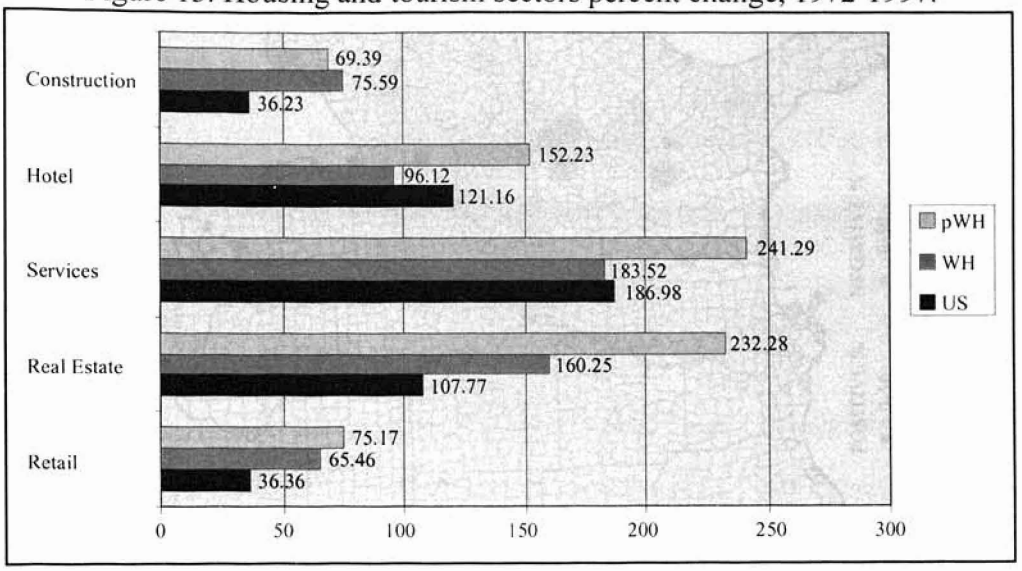
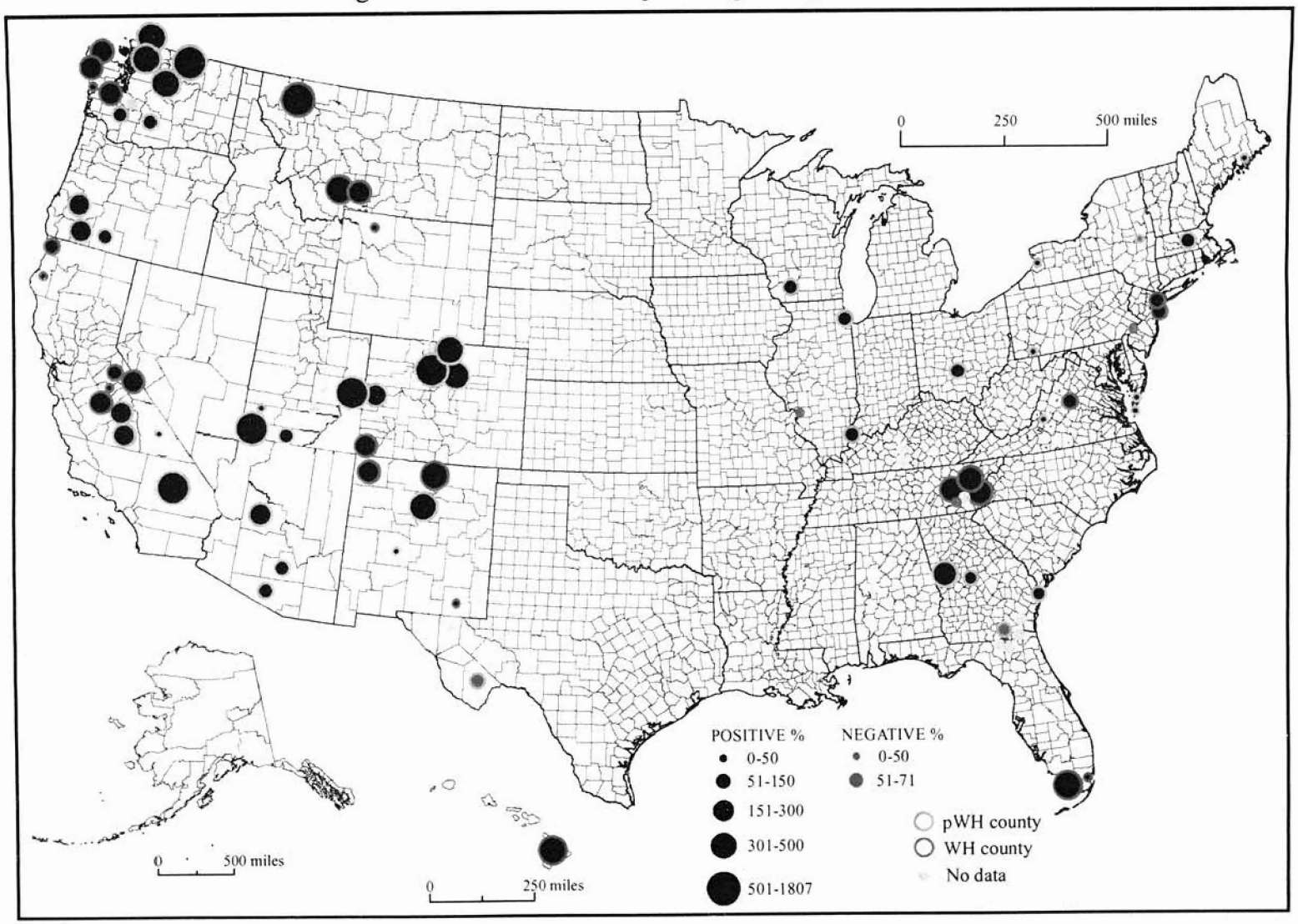


Figure 14 highlights the real estate boom experienced in the western U.S. over the study period. The east-west dichotomy is starkly apparent on this map. A host of pWH and WH sites exhibit growth in the real estate sector exceeding 150 percent. Five of twenty-seven eastern study counties exhibited growth exceeding 150 percent while 29 of forty-six western study counties met this criterion. In reviewing the real estate sector, the east-west contrast demands precedence over the WH/pWH classification.

Figure 14. Real estate sector percentage change, 1972-1997.



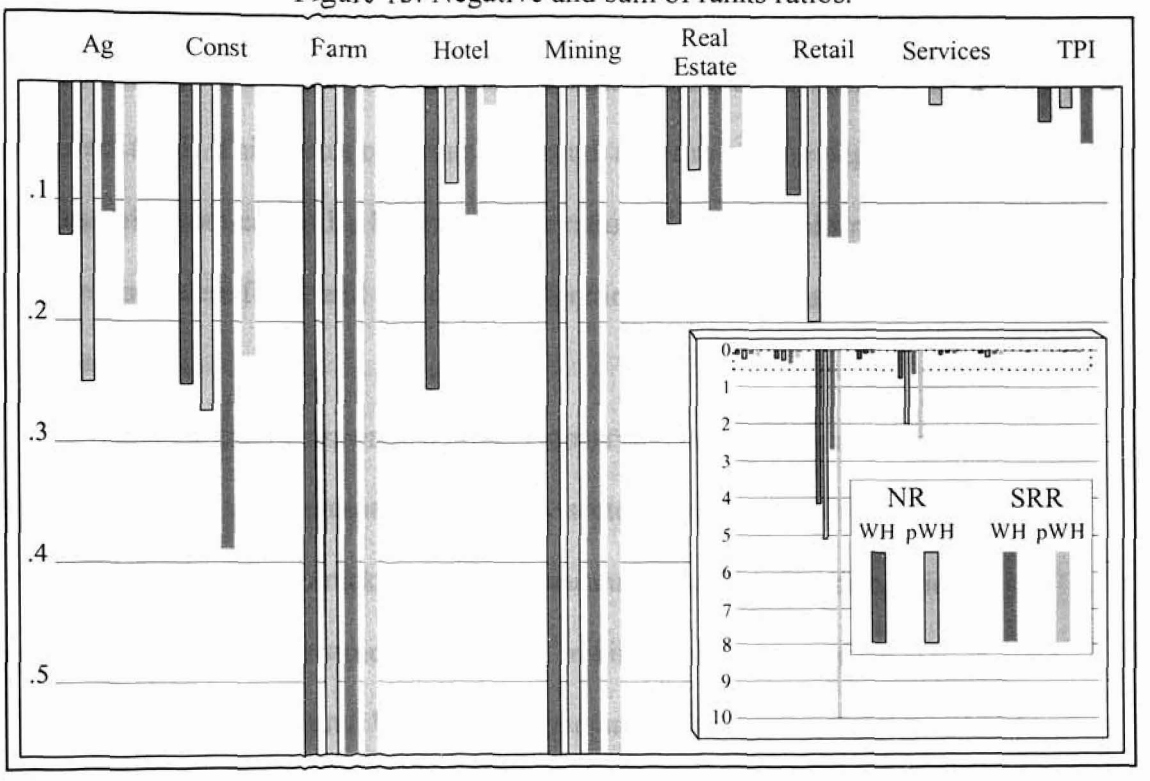
The Wilcoxon matched-pairs signed-ranks test allows analysis of economic data from a different perspective. With the signed-ranks test, it is possible to gain a better grasp of the economic changes that have taken place on a case-by-case (county-by-county) basis. Instead of combining the WH and pWH samples into a single ranked set (as was the case with the Wilcoxon rank sum test), this test highlights change within each sample from 1972 to 1997. By utilizing several simple calculations (Fig. 9), components of the matched-pairs signed-ranks test (mean rank and sum of rank values) can be converted to figures that describe the direction and magnitude of change for economic sectors within the WH and pWH samples.

Reviewing the real estate sector, the signed-rank figures parallel the high rank sum *p*-values in 1972 (.809) and 1997 (.869). Low NR values (.111, .073) and lower yet SRR values (.105, .051) reinforce the perception of sample similarity. This affirms the assertion that the east-west dynamic plays a more prominent role than World Heritage status.

Figure 15 displays a bar graph of the negative and sum of ranks ratios. SRR values were generally lower than NR values indicating that observations that registered an economic decline experienced smaller changes than those observations with positive gains. This would generally be expected with temporal economic data. In other words, one would expect most economic sectors to experience more substantial gains than losses when comparing observations recorded 25 years apart. The sectors that defy this trend are worth noting. These include construction, retail, and total personal income for World Heritage counties as well as farming, mining, and retail for potential World Heritage counties. These sectors have experienced disproportionately large declines compared to

gains. The largest discrepancies as represented by the SRR difference occurred in the farming and mining sectors of potential World Heritage counties.

Figure 15. Negative and sum of ranks ratios.



The declines in the mining sector for pWH counties are particularly noteworthy. Claims that World Heritage designation has had disproportionately adverse affects on local economic climates as evidenced by the New World Mine scenario are not indicated by this analysis. Not only have more than double the percentage of pWH counties witnessed downturns in mining compared to WH counties, but also the magnitude of those downturns has far exceeded that of WH counties.

Similarly, another natural resource related sector, farming, has witnessed a greater percentage of pWH counties losing economic ground over the period of World Heritage

establishment. The magnitude of declining pWH farming values is more than three times that of comparable WH values. While the farming sector has suffered across the United States in the last quarter century, WH counties have not recorded the precipitous falls in revenue experienced by their pWH counterparts.

The agricultural services, forestry, and fisheries sector rounds out the natural resources triad. This sector continues the trend, albeit to a lesser degree. Once again the WH sample produces both a lower negative ratio and sum of ranks ratio. Its negative observations were fewer and showed less significant declines than those found within the pWH sample.

Parallels can be drawn in a broad comparison between the rank sum test, the signed-ranks test, and percentage change by sector. Upon review of the rank sum test, World Heritage counties ranked higher (lower mean ranks) in the categories of agricultural services, construction, farming, mining, real estate, and services in 1997. The signed-ranks test, found World Heritage counties had lower negative ratios from 1972 to 1997 in agricultural services, construction, farming, mining, retail sales, and services. A review of percentage change by sector illustrated that WH counties have averaged higher growth in the mining, agricultural services, and construction sectors. While findings of statistical significance (.05 confidence level) were a rarity in this study, the corroboration of findings suggests that the World Heritage counties have performed as well or better in the natural resource sectors compared to the potential World Heritage counties. Results from the housing and tourism related sectors are uneven, with less association on a World Heritage designation basis readily apparent.

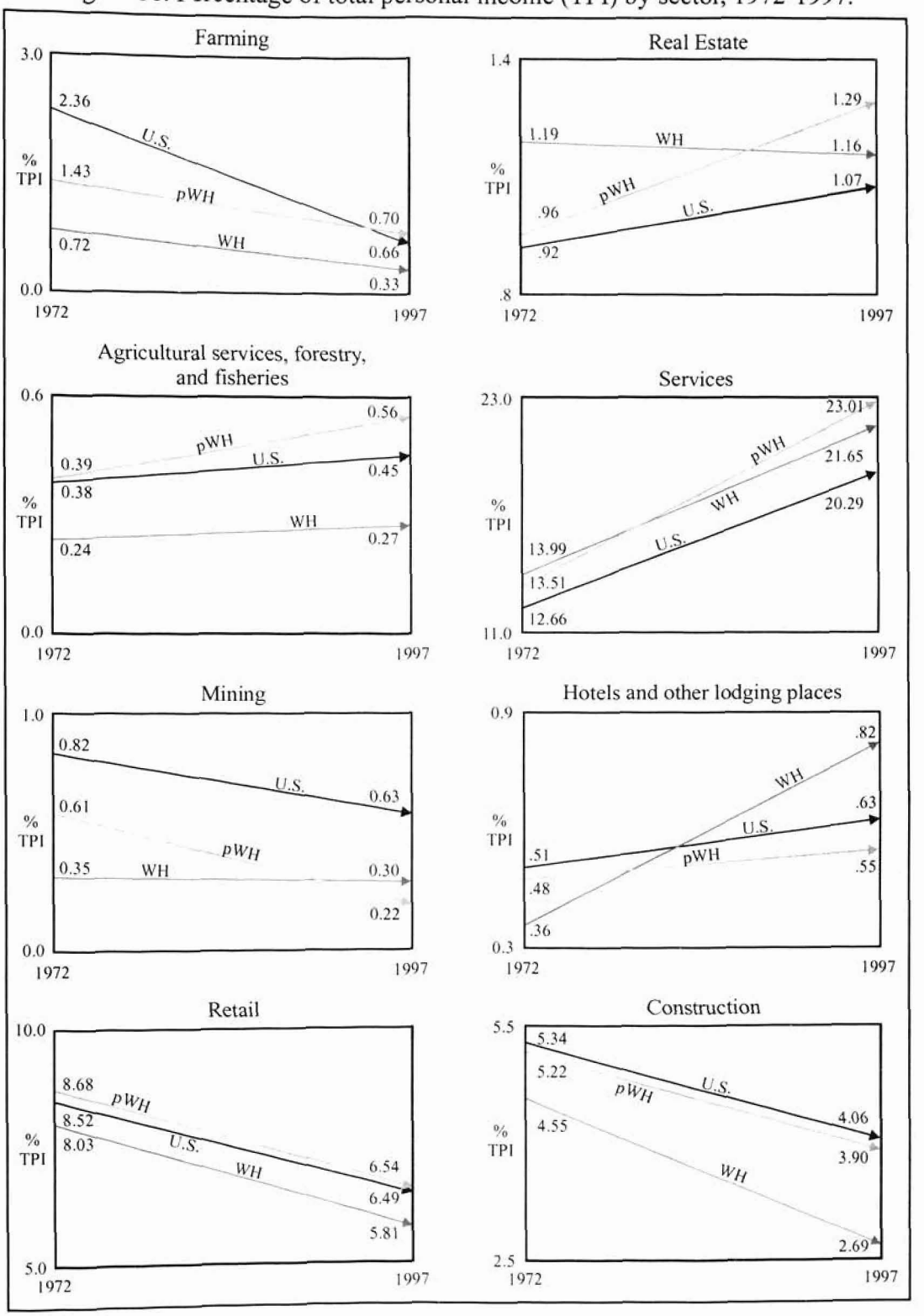
In light of the previous sector analysis, an additional perspective on sector performance that provides a "big picture" snapshot of trends in WH and pWH county economies is helpful. Figure 16 displays the percentage of total personal income each of the eight sectors represents for the respective samples for 1972 and 1997. This information is plotted alongside representative data for the U.S.

This figure illustrates sectors that are gaining or losing shares of the total economy. While WH and pWH movements generally parallel U.S. trends, there are several noteworthy points for comment. The first pertains to the natural resource sectors. While the previous discussion concluded that WH counties had performed as well or better than their pWH counterparts, this illustration points out that these sectors represent smaller percentages of the overall economies of WH counties. The share of mining in WH counties has held steady compared to notable drops in pWH counties and the U.S. in general.

A similar trend for WH counties is evident in the agricultural services. However, pWH and U.S. shares in this sector have increased in spite of indications from the previously employed methodologies that WH counties had an advantage in this sector. This is explained by the notably smaller share of agricultural services in the total economy of WH counties.

Although WH counties may have registered a higher mean percentage change, for example, this does not necessarily equate to a dominant role of that sector in the economy. In other words, smaller positive percentage changes in an industry with a larger share of the total economy will outweigh larger positive percentage changes in an industry with a smaller share of the total economy.

Figure 16. Percentage of total personal income (TPI) by sector, 1972-1997.

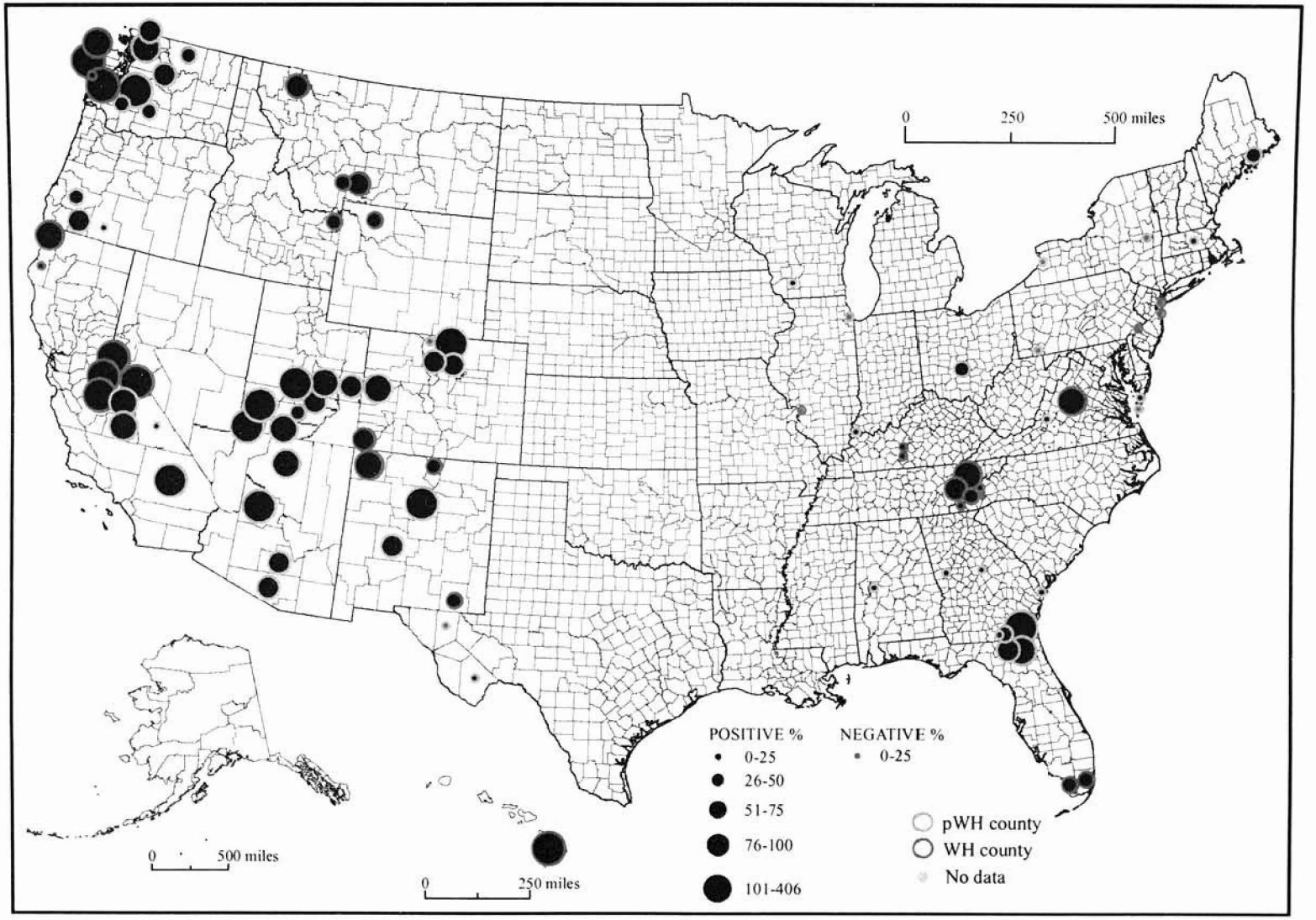


The hotel sector provides evidence that this dynamic works in an inverse fashion as well. The WH percentage of TPI has more than doubled over the study period, as evidenced by the steep slope of the WH arrow in Figure 16. However, Figure 13 indicates that the WH sample had a lower increase (96%) than either the pWH sample (152%) or the U.S. (121%).

A sector exhibiting a downward trend in this figure should not be interpreted as a sector with no growth. In many cases, other sectors have improved at a greater rate to increase their share of the total economy. For instance, the construction sector for both samples and the U.S. drops substantially over the study period. However, the construction sector experienced mean gains of 69 percent (pWH), 75 percent (WH), and 36 percent (U.S.) over the study period (Fig. 13). Construction has lost its share of the economy to sectors such as services that registered gains of 241 percent (pWH), 184 percent (WH), and 187 percent (U.S.).

Returning to the population analysis completed above, a closer look at the signed-rank test results reveals that nine of eleven observations recording a drop in population between 1972 and 1997 were highly urbanized counties. The two exceptions were Culberson Co, TX and Jackson Co, CO. These counties experienced population declines of 303 and 474 respectively. These figures are small in comparison to the 429,060 drop in Cook Co, IL or the 441,696 decrease in Philadelphia Co, PA and corroborate the scenario presented in the discussion above. Paralleling Figure 14, Figure 17 displays the disproportionate population growth found in the western United States.

Figure 17. Population percentage change, 1972-1997.



Many people are migrating away from America's more urbanized locales to find their piece of the rural American dream in a substantial counter-urbanization movement (Beale and Johnson 1998, Morton 2001, Power 1991; Reading, Clark, and Kellert 1994). The implications of the changing population dynamic of the U.S. are reflected in many of the economic figures presented above. While the presence of World Heritage undoubtedly contributes to the county level economic environment, the larger forces at play in the evolving population dynamic cannot be denied. It should also be noted that the presence and proximity of protected areas such as national parks and World Heritage sites influence individuals' decisions to undergo counter-urban migration.

Previous research has indicated quality of life and amenity-based migration coupled with tourism have greatly benefited the rural counties of the West in the face of declining resource extraction income (Glick and Alexander 2000; Howe, McMahon, and Propst 1997). It can be surmised that the destinations of quality of life migrants will often be locales near protected natural landscapes. It can be further deduced that the World Heritage and potential World Heritage counties recognized for their natural attributes experience more of the economic benefits of this migration. Conversely, it is reasonable to suggest that some cultural counties, more often associated with urban environments, have witnessed a degree of economic decline as a result of out-migration.

Referring back to Table 11, it is evident that World Heritage counties have a disproportionate representation of natural amenities in comparison to potential World Heritage counties. Conversely, one-fifth of WH counties are classified as cultural, while more than two-fifths of pWH counties are classified as cultural. This distinction between cultural and natural sites proves to be a significant consideration when one considers that

urban counties will have distinct advantages over rural counties in certain economic sectors. The opposite of this is true as well, with rural counties having a decided advantage in the natural resource sectors. This realization colors review of this economic analysis, and adds weight to the use of a multifaceted methodological approach.

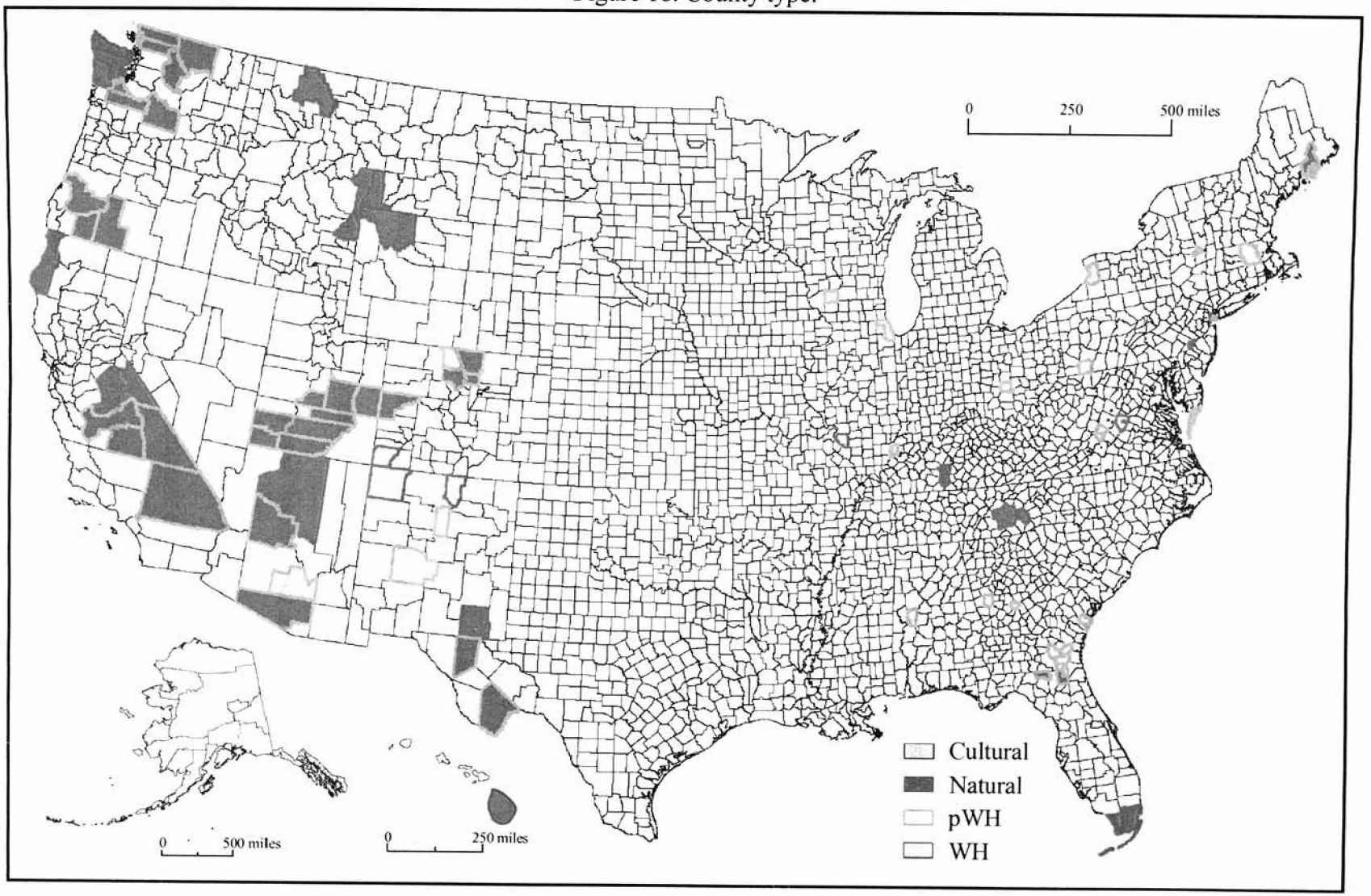
Figure 18 displays WH and pWH counties classified by type. An interesting pattern emerges. Not only is the preponderance of natural WH counties evident, but also the patterns of natural counties as western and cultural counties as eastern. This leads to a subsequent association between the West as home to rural, natural World Heritage counties and the East as home to urban, cultural potential World Heritage counties.

Classifying study counties by natural or cultural designation revealed a striking divergence that conforms to the previous discussion. Table 12 displays the results of the Wilcoxon matched-pairs signed-ranks test performed on the study counties classified by their natural or cultural designation. One-third of the counties classified as cultural experienced a population decline over the study period, whereas only one of 60 observations classified as natural recorded a decrease in population. This result contributes to and reinforces the developing image of the prototypical World Heritage county as a 'natural' destination for those seeking a literal change of scenery.

Table 12. Wilcoxon matched-pairs signed-ranks test, cultural vs natural.

	Period	Type	+/- Ranks	N	Mean Rank	Sum of Ranks	P-Value
Population	72-97	Cultural	Neg	10	19.70	197	.465
			Pos	20	13.40	268	
	72-97	Natural	Neg	1	1.00	1	.000
			Pos	59	31.00	1829	

Figure 18. County type.



When one considers the changing economic dynamics of America's rural lands over the last quarter century, it is possible to read deeper into the results presented above. As was documented in the preceding review of literature, there has been an increasing desire for people to move away from the problems of heavily urbanized areas to the expanses of a more pristine rural America, particularly the West. Quality of life issues are often central to the decisions of the shifting population. People envision trading pollution and skyscrapers for clean air and craggy peaks.

This counter urbanization trend can have a multitude of effects. First, it may lead to a decline in population and economic vitality for urban areas. Second, and perhaps more importantly, the migrants alter the economic environment of their destination. They bring a little bit of the city with them as they import not only themselves, but also their spending power. Existing businesses are impacted and many new services are provided to serve the new migrants. Ironically, these new services make their new location increasingly like their old one. Limited numbers of migrants can have profound impacts on the smaller economies of rural counties.

The quality of life migrants place great value on their natural surroundings. They encourage strict protection of *their* new land. A new strip mine or clear-cut may garner adamant opposition from the changing population dynamic. This is not to imply that this is the primary pressure on the waning fortunes of the resource extraction industries. It merely exacerbates the decades-long declines in revenue that are a result of a complex mixture of changing regulations, resource depletion, and international competition.

In light of rural counties having the qualities meriting a natural designation by World Heritage coupled with their transitional nature, one would expect to see the WH

counties maintain an advantage over the pWH counterparts in the natural resource sectors. Additionally, one would expect that gap to be declining, as the Wilcoxon rank sum test statistics suggest, as a result of the sagging nature of the industries combined with the evolving rural economy.

Yet another consideration is that of the relative size of natural sites in contrast to cultural sites. Those sites designated as natural are notably larger than cultural sites in virtually all instances. For instance, Yellowstone National Park exceeds 2 million acres, while cultural sites such as Independence Hall may be smaller than a city block. The size differential allows natural sites to have an immediate economic impact on a much larger surrounding area. Visitors entering the larger sites from a multitude of points may enhance this effect.

An interesting corollary to the discussion of site size relates back to the World Heritage Convention. Under the Convention, signatory states are obligated to protect the unique qualities of World Heritage sites from external threats. Needless to say, this is a more daunting task for managers of Yellowstone than Independence Hall. In the case of natural sites, an inclusive ecosystem management approach may best exemplify appropriate management techniques to fulfill the requirements of the Convention. This issue came to bear in the case of the New World Mine as previously discussed. While the idea of protection beyond the bounds of natural sites has rarely been tested in the U.S., the New World Mine case illustrates an ecosystem management approach in the maintenance of natural environments surrounding natural World Heritage sites. Protection of these landscapes potentially strengthens the dynamic of rural western

counties relying on quality of life resources and tourism to anchor their economies of the present and future.

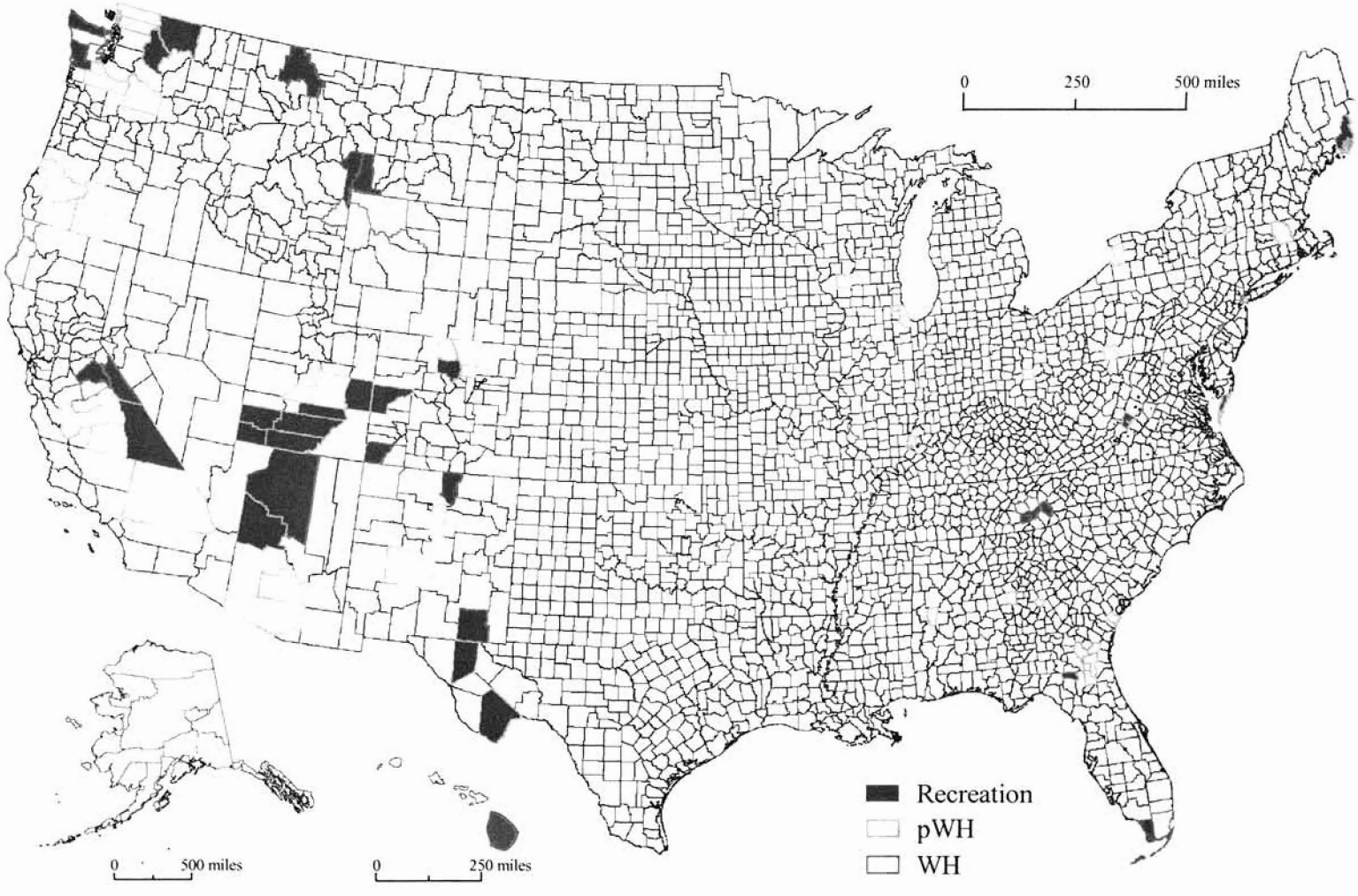
A final tangent of the discussion regarding the disproportionate influence of natural sites on the overall economic analysis presented in this study relates to the research of Beale and Johnson (1998). As discussed in chapter three, Beale and Johnson identified recreational counties in the United States. They found that these counties economically outperformed non-recreational counties, using population growth as a proxy measure of the economy.

Of the 285 counties they identified in their study as recreational, 16 were World Heritage counties and an additional 18 were potential World Heritage counties (Table 13, Figure 19). While 46 percent of the WH sample counties were identified as recreational, that figure falls to 33 percent for the pWH sample. By this measure, the WH sample would appear to have an advantage. However, the population analysis completed for this study found no statistically significant differences delimited by WH or pWH status. Only when the study counties were segregated based upon natural or cultural classification were significant discrepancies evident. In a roundabout fashion, however, this gives an advantage to the WH sample with its much higher proportion of natural counties (Table 11).

Table 13. Recreational counties

	N	Cultural	Natural
WH	16	2	14
pWH	18	2	16

Figure 19. Recreational counties.



Source: Beale and Johnson, "The Identification of Recreational Counties," Population Research and Public Policy 17 (1998), 37-53.

Figure 19 contributes to the east/west dichotomy discussed above. Recreational counties are predominantly western and natural. They are evenly distributed between WH and pWH counties of the West, although the WH counties have a higher overall proportion of recreational counties.

While this discussion may have strayed from the explicit task of evaluating impacts of World Heritage designation on county level economics, it has succeeded in developing a contextual sketch of the economic environment in which the World Heritage program exists. Perhaps the term coexists is a better fit. As with any economic analysis, no matter how coarse or how fine the resolution, there will always be difficulties in isolating the impacts of that which is studied. In this case, it would be virtually impossible to study the impacts of World Heritage designation on communities surrounding Yellowstone National Park, for instance. How could one adequately separate the national park status or biosphere reserve status from the World Heritage designation? It is possible, however, to study and note trends and themes that exist and are in integral part of the World Heritage milieu.

In this case, the results of the statistical analysis provided evidence to support the contention that the samples of World Heritage counties and potential World Heritage counties were, as a whole, statistically non-differentiable. A variety of statistical measures have provided evidence that World Heritage counties have outperformed their potential World Heritage counterparts in natural resource sectors of the economy.

Claims of critics citing adverse consequences for natural resource sectors operating near World Heritage sites cannot be supported by this analysis. As this analysis has revealed, the rural, western nature that characterizes the prototypical World

Heritage county is just the environment in which the resource-related sectors are based. In more recent years, these locations have become ideal targets of migration for retirees, dot-comers, and those seeking an alternative to the urban jungle. As a result of this migration, as well as the imported values of the migrants, the local economies are undergoing new influences as they shift from resource-based economies to quality of life and amenity-based economies. While World Heritage is not the catalyst behind this change, it is an essential part of the protected lands matrix that acts as a magnet to people across the country.

CHAPTER SIX

CONCLUSION

The focus of this research has been to assess the local economic impact of the World Heritage program in the U.S. This study found no significant evidence that World Heritage can be branded as an economic liability for communities adjacent to World Heritage sites. Additionally, this investigation has shed light on a myriad of intertwining elements of the ongoing World Heritage debate.

In summary, the World Heritage program is a UNESCO-sponsored program with a mission of recognizing and protecting the world's most treasured natural and cultural sites. One hundred seventy-four countries participate in the program. As of July 2002, there are 730 World Heritage sites in 125 countries, including 20 within the United States (UNESCO 2002).

Additionally, 33 of these sites have been designated "in danger" from a variety of natural causes and human intervention. Yellowstone National Park was placed on the List of World Heritage in Danger in 1995 to address a variety of threats including geothermal development and loss of habitat for grizzly bears. However, the potential development of the New World Mine garnered the lion's share of public attention. This gold mine would have been located within three miles of the park boundary. A consortium of groups including World Heritage's administrative body (World Heritage Committee) voiced strong opposition to the mine. A settlement with the federal government halted the project in 1996. However, the involvement of the World Heritage Committee in the public debate led some to claim that a usurpation of U.S. sovereignty

had occurred. Introduction of the American Land Sovereignty Protection Act followed shortly thereafter.

Introduced in the 105th through 107th Congresses, the American Land Sovereignty Protection Act seeks to curtail or eliminate United States' participation in internationally sponsored land protection programs such as World Heritage. Sponsors have declared that the international committees that administer these programs represent non-democratic governments and do not represent the best interests of the American people.

While this legislation has focused on a perceived usurpation of sovereignty by these programs, legislators have also targeted what they have asserted is excessive influence by the Executive Branch within the realm of domestic land use policy-making (U.S. House of Representatives 1999). Furthermore, ALSPA proponents have contended that local economies suffer in the wake of World Heritage designation (McHugh 2000). By agreeing to manage sites in accordance with the international Convention, proponents suggest that World Heritage designation has resulted in lost revenue and local jobs.

On the other hand, opponents of ALSPA have stated that there is no merit to claims of ceded sovereignty from participation in programs such as World Heritage. They have asserted that the World Heritage Committee has no authority beyond listing sites, providing financial assistance, and offering technical advice. Opponents continue by citing ALSPA as a threat to the international environmental leadership role of the United States. Moreover, they have claimed that World Heritage designation does not impede economic growth, but rather promotes it, particularly in tourism-related sectors of the economy.

In light of the Congressional debate, a review of the World Heritage economic environment becomes more important. How has the title of World Heritage site affected a collection of U.S. parks and protected areas? Thus far, literature regarding the economic impacts of World Heritage designation is deficient. However, a survey of the diverse collection of literature concerning the impacts of parks and protected areas on local economies was provided in Chapter 3. Common themes included the use of disparate methodologies to analyze economic impacts of protected areas (Allen 1993; English, Marcouiller, and Cordell 2000; Jobes 1991; Johnson 1993; Leatherman and Marcouiller 1996; Power 1991; Wong 1996; Yaffee 1996). Additionally, researchers have commented on the difficulties of isolating the impacts of particular recreation resources (Johnson 1993). In recent years, studies have focused on the role of protected areas in local economies of the West as the transition is made from resource extraction to tourism and amenities (Beale and Johnson 1998; English, Marcouiller, and Cordell 2000; Glick and Alexander 2000; Morton 2001). Another important theme related to migrants seeking a high quality of life in the rural landscapes of the West (Dowling 1993; Glick and Alexander 2000; Power 1991; Reading, Clark, and Kellert 1994).

This study sought to address the lack of literature regarding the economic sphere of World Heritage. The use of two complementary statistical tests was identified as the primary vehicle for determining the extent to which World Heritage designation positively or negatively impacted local economies. These tests were utilized to compare a sample of counties that contain and/or are adjacent to World Heritage sites and a second sample that contain and/or are adjacent to sites identified as potential World Heritage sites.

The Wilcoxon rank sum test was utilized to detect significant differences in a coarse economic comparison of World Heritage counties and potential World Heritage counties. This test allowed for direct comparison of economic sectors relating to natural resources (agricultural services, forestry, and fisheries, mining, and farming) as well as housing and tourism (construction, retail trade, real estate, services, hotels). The use of 1972 *and* 1997 data allowed for a degree of inferential analysis pertaining to how the economic landscape has changed over time in the immediate vicinity of World Heritage and potential World Heritage sites.

The Wilcoxon matched-pairs signed-ranks test statistic was utilized to illuminate the magnitude of change by sector when comparing the two samples. Interpretation of these results was used to reveal whether industries in either of the samples were showing substantial directional change. Calculations to determine a proportion of negative to positive ranks (negative ratio), and the proportion of the negative sum of ranks to the positive sum of ranks (sum of ranks ratio) were devised to highlight the proportion and magnitude of change within each sector of the samples.

Beyond the use of the test statistics to evaluate pertinent economic sectors, total personal income and population were reviewed. Combined with a review of percentage change by sector over the study period, as well as a snapshot of percentage of total personal income by sector, these results helped to paint a broad picture of the World Heritage economic environment.

In terms of an economic appraisal of World Heritage, the Wilcoxon rank sum test assisted in the comparison of two non-normal samples to determine if they were drawn from the same population, providing the first key finding of this study (Fig. 20). Results

of this test help to show that the World Heritage and potential World Heritage counties were drawn from the same population by displaying no statistically significant differences. For the eight sectors plus total personal income included in the analysis, the lowest recorded *p*-value (.137) exceeded the .05 significance level.

While no statistically significant differences were detected, a closer look at the figures allowed a degree of inference and represents the second key finding. World Heritage counties outperformed their potential World Heritage counterparts in the sectors identified as natural resource related in 1972 and 1997. The idiographic analysis of the signed-rank test supported this conclusion. Furthermore, a percent change analysis provided a different perspective that corroborated this finding.

The third key point relates to the general characteristics of the study counties that emerged over the course of this research. A series of associations were revealed. First, World Heritage counties had a significantly higher proportion of sites recognized for their natural values. In comparison, potential World Heritage counties had a higher proportion of sites recognized for their cultural attributes. This helps to explain better performance by WH counties in natural resources sectors. Natural sites are more likely to be found in settings that are more conducive to natural resource development. Furthermore, more counties in the western United States have been recognized as World Heritage or potential World Heritage sites for natural qualities. Conversely, the eastern United States has a higher proportion of current and proposed World Heritage sites that have been recognized for their cultural significance.

Figure 20. Key findings.

1. There are no statistically significant differences in economic performance between WH and pWH counties

2. Although not statistically significant, natural resource related sectors performed better in WH counties than pWH counties in 1972 and 1997

3. The prototypical World Heritage county is in the West, is recognized for its natural attributes, and has been subsequently identified as a recreational county

Therefore, the prototypical World Heritage county is western, rural, recognized by the World Heritage Committee for its natural qualities, and has been identified by Beale and Johnson (1998) as a recreational county. As the completed statistical analysis of population confirmed, this all but guarantees a burgeoning population. The growing county populations, according to the literature are likely to be composed of migrants seeking a high quality of life near an outstanding natural environment (Beale and Johnson 1998 1998, Glick and Alexander 2000, Howe, McMahon, and Propst 1997, Lewis and Plantinga 2000, Lorah 2000, Morton 2001, Power 2001). World Heritage counties reap disproportionate benefits of migration in comparison to potential World Heritage counties, as Americans increasingly target these destinations.

These findings add a heretofore-missing component to the World Heritage debate. To date, no consideration and analysis of the economic influence of World Heritage designation has entered the Congressional debate. This study provides an injection of new material to the current imbroglio. Beyond this, the included explanation and overview of the World Heritage program could be used as a foundation upon which to build an informed opinion of the program. It does so in two ways. First, it provides an unbiased introductory text on the components of the World Heritage program. Furthermore, it examines literature regarding the implications of World Heritage to

national sovereignty. A review of the extensive adjudicatory history of World Heritage in Australia combined with a history of the World Heritage Committee's intervention actions aid in this endeavor. Second, it addresses a prominent theme of the debate that World Heritage designation adversely affects the economic productivity of surrounding counties. This analysis of the economic sphere of World Heritage does not corroborate these claims. These findings are unique and unparalleled to date.

This study can also contribute to filling some notable voids in the body of current literature. To date, research regarding World Heritage is sparse. Most printed material addressing World Heritage can be classified as descriptive and historical. The notable exception is the body of legal analysis that deals with Australia.

More specifically, this study is the sole contribution to the theme of economic impacts of World Heritage. While a significant body of work has examined the impacts of other forms of protected areas such as state and national parks and federal wilderness (Beale and Johnson 1998, Dawson et al. 1993, Dean et al 1978, Duffy-Deno 1998, English, Marcouiller, and Cordell 2000, McNeely 1990, Morton 2001, Power 2001, Schroeder 1982), this study is focused on World Heritage status. Perhaps the recent surge of literature regarding economic impacts around Yellowstone is an indication of future trends (Glick and Alexander 2000; Howe, McMahon, and Propst 1997; Jobes 1993; Power 1991; Reading, Clark, and Kellert 1994). However, the fact that these studies fail to recognize Yellowstone as a World Heritage site suggests a continued dearth of literature regarding World Heritage.

Describing World Heritage as a contributor to the transitioning economies of the West fits well with an emerging body of literature. Researchers have focused on the

transformation from resource extractive economies to those based on recreation, tourism, and retirement (Glick and Alexander 2000; Johnson 1998; Howe, McMahon, and Propst 1997; Reading, Clark and Kellert 1994; Jobes 1993; Power 1991). As discussed in this study, the location decisions of migrants, tourists, and retirees are largely related to the high value placed on a matrix of natural values that enhance quality of life (Beale and Johnson 1998; Howe, McMahon, and Propst 1997; Morton 2001). These are the values found in the vicinity of natural World Heritage sites.

Dowling (1993) claims that as more people benefit from the location decisions made as a result of these natural values, the more people will seek to protect these values. As more people identify with World Heritage as a means of protection (and therefore a positive contributor to their economic well-being), perhaps the label will become more valued. Moreover, this study adds another voice to Lewis and Plantinga's (2000) economic appraisal of the effects of conservation lands. They claimed that jobs followed people's residential location decisions, rather than people seeking out employment opportunities.

This study may offer another methodology to ascertain the economic impacts of a protected landscape (English, Marcouiller, and Cordell 2000; Johnson 1993; Leatherman and Marcouiller 1996; Power 1991; Wong 1996; Yaffee 1996; Johnson 1993). Mirroring the problems of numerous attempts, difficulty in isolating the effects of World Heritage can be noted. Like Duffy-Deno (1997,1998), Leatherman and Marcouiller (1996), Morton (2001), Wong (1996), and Yaffee (1996), this study utilized several proxy measures of economic impacts to determine its results. Although this attempt is more simplistic than other models, it provided some useful findings by dispelling the notion of

widespread local economic misfortune associated with World Heritage. However, distinct methodologies may yield varying results from the proxy measures employed here. While comparison of World Heritage and potential World Heritage was a logical starting point for economic analysis, a reasonable progression would evaluate World Heritage counties against a sample of counties with similar characteristics (e.g. western, natural, recreational) as determined by this study.

A methodology producing a higher resolution analysis of areas surrounding World Heritage sites is also desirable. A current provision of ALSPA would require analysis of a 10-mile buffer zone around designated sites. To date, no methodology has been proposed for such an analysis. Problems with data disclosure would make this task difficult. However, proposals for alternative methodologies utilizing proxy economic measures would be welcomed.

This study has taken a notable step in educating and enhancing the debate over the future over World Heritage in the United States. While this study rejects the claims of those citing World Heritage as an economic liability, the topic presents great opportunity for further study. As World Heritage continues to play a role in defining some of the country's most desirable locations, the tourists will continue to flock to these sites, and the quality of life migrants will continue to perceive locations near protected landscapes as desirable. These are themes that should be considered in the ongoing evaluation of World Heritage.

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VITA 2

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Candidate for the Degree of

Master of Science

Thesis: CHALLENGES TO U.S. PARTICIPATION IN THE WORLD HERITAGE PROGRAM: A COUNTY-BASED ECONOMIC EVALUATION

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