

Dams on the Columbia River

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Dams along the Columbia river have been an indisputably important factor in the long history of the northwest. The dams that were constructed along the rivers in the area, provided huge amounts of electricity and water to vast new areas in the northwest. Then on top of that with the massive surplus of water that was made available, the agriculture industry grew rapidly, and expanded to cover more territory in of the inland areas of the state. The electricity that was made extremely cheap allowed more intensive industries like manufacturing to become extremely viable and profitable in the northwest. Theses industries kick-started the economy of the northwest and drew thousands of employees to the area. However, these dams were also very negative for many people. They destroyed the natural flow of the river. They flooded many traditional lands that were used by the native Americans, and the dams greatly disrupted the migration of native fish populations. There are may voices that speak out in favor of the dams such as large companies, or major businesses, nominally the people who are supporting the dams have an economic advantage. Then there are the many other groups who are opposed to the dams along the Columbia river, such as the native Americans, the environmentalists, many fishermen. These people have much less economic interest in the dams, and some actually have an economic interest in the lack of the dams. Each side of the argument has their own voices for and against the damming of the river. The damming along the Columbia river has been a critical par of the history of the northwest, and without it, the region would not be anything that it is today, however, as newer technology has allowed the benefits of the dams without the great amounts of environmental harm, there has been a more successful push for the removal of some of the dams along the Columbia. The dams on the Columbia were of great importance to the history of the northwest, and without them the region would have developed completely differently.

The first explorers to come to the northwest were on the search for a major transportation river, that could connect to the eastern half of the country. This great river highway would allow for Americans to easily cross the country by boat, and would open up a wealth of new opportunities. The Columbia River was initially hoped to be a major transportation network, but as further exploration revealed, the river was extremely difficult to navigate, and the section of the river that were navigable was extremely one sided. A ship could

take weeks traveling a short distance up river, a distance which could be covered in only a few days when traveling down river. This discrepancy between the efficiency of the travel speeds meant that the Columbia river and its major tributaries were not a viable network for transportation of goods. And in a world where every major city is constructed on the ocean or a major river for transportation, this meant that the Columbia river would not be well suited for many large cities further up river than Portland which was considered the furthest upriver that major ocean ships could travel. However, with the construction of the dams, this dream of the Columbia being a major transportation network has come closer to a reality than it ever has been before. It is now possible to ship thousands of tons of goods up and down the Columbia river, and it is all only because of the dams along the river to create the reservoirs that river boats can successfully navigate. Although it is not perfect, and has caused numerous other issues, the Columbia river has been a major shipping route for the northwest, shipping thousands of tons of goods a year [3]. With the vast amounts of goods that are exported by means of the Columbia river, all of which would not be possible at the present scale if not for the dams along the river.

The dams along the Columbia and Snake river are vital to the agriculture industry of the northwest. The dams provide huge amounts of water for the inland farms that were constructed in the desert of the northwest. However, this extremely fertile soil can be accessed, because of the dams. Dams such as the Grand Coulee dam were constructed to easily provide irrigation water to thousands of farmers in the area. The water that these dams can provide for inland farmers has been a key factor in the agricultural growth of the northwest. This water has in fact allowed the Columbia and Snake river area the largest exporter of wheat in the United States, with an export amount of currently 11 million tons of grain exported from the Columbia river [8]. Thousands of farmers rely on the water provided by the dams along the Columbia river, there are approximately 5,100,000 acres of land that are irrigated by the Columbia river water [11]. And this water is a vital part of the industry. Other than hydroelectric power, agriculture is the next largest consumer of Columbia river water. The huge industry of agriculture needs the dams to exist, as most of the extremely fertile land in the northwest is located in deserts, and does not naturally receive enough water for proper irrigation, and agriculture. One clear aspect of a voice that clearly shows

its support of the dams is from the Washington Grain Commission (WGC). The WGC has a list of “Facts” on their website, which although all of their sources are trustworthy, the facts that were selected all clearly demonstrate their bias towards the dams, and their clear support of the dams [15]. The reliance of the Columbia river dams for irrigation water, and the fact that without the dams, millions of acres of farmland would not exist, is a clear sign that the agricultural industries heavily relies on the dams, and needs them in order to be profitable.

The large farmers were greatly benefited by the Columbia basin project, because the dams provided plenty of water and electricity for any farm land. Even though the initial plans were for much smaller farm lands, and so the units of land were started in a much smaller range of 10 to 160 acres depending on the quality of the land [14]. However, these small sized farm units grew outdated, as new technology made it easy for a few farmers to maintain a large amount of land. This growth of technology while the rules of the lands remained stagnant was a major cause for the shift to larger farms. Because a few farmers could easily manage land in excess of the previous maximum 160 acres, congress passes a new law that allowed farm operators to hold multiple units each up to 160 acres, and along with that, there was the free ability to lease farm units to others [14]. So it was common for a few farmer to be managing much more land than the plan initially intended. The average farm size grew from 84 acres to 107 acres.

The small farmers in the northwest were greatly affected by the construction of the dams. As the dams allowed their water and electricity to be extremely cheap. This meant that all the farms in the region could easily water all of their land and keep their crops sustainable for many years. Thousands of acres of land was opened up for the small farmers to use, and for thousands of immigrants to begin a new life with. Regions around the rivers that had a dam were suddenly a destination for travelers because of the vast availability of the land. Many of the counties even created hundreds of blocks of land that were allotted to farmers who wanted them. Most of these farm lots consisted of 140 acres, so every farm was relatively small, and designed to be managed by a single family. All of these steps were taken in order to benefit the small farmer as much as possible. However, their results were the opposite of what the planners initially wanted. In the following years most of these small

farms were taken over by large super farms. These super farms control hundreds of acres, much beyond the initially allotted 140 acres. These super farms were able to thrive in the situations that dams had created. Because electricity and water was made extremely cheap, the super farms could easily afford to pay for the irrigation of their entire lands. Then with the advancement in technology, these super farms could maintain more land with fewer workers, making it much more viable to control large tracts of land. Along with all of those factors, the farming equipment that was necessary for irrigation of the land, was very expensive, so the small farmers who needed it could not afford it, but the super farms, could easily afford the equipment, and would earn enough money to pay it off quickly. Although the dams were constructed with the intention of supporting the small farmer, they incidentally created an environment that was perfect for large scale industrialized farms.

Small family run farms, is most peoples hope of the perfect farm lands. However, this is rarely the reality, instead most farm land is large scale corporate owned farm land, that is run by machines, and very few workers. With the Columbia Basin Project many organizers were hopeful that they could change this and achieve an area of family run farmlands. The Columbia Basin Project was an initiative that aligned with the construction of the dams along the Columbia river, to irrigate much of the extremely dry Columbia basin. The project very ambitiously planned to irrigate 1,100,000 acres of land with the water that would be backed up due to the construction of the Grand Coulee Dam. The plan was to distribute the land into blocks of 140 acres, and divide this land up among thousands of small farm families who could then live there, and begin a new farm [12]. The initial intentions were valid for the planners, to try to draw small farmers to the area with cheap and subsidized land, then provided government-subsidized irrigation for the land by means of the Grand Coulee Dam. However, this did not proceed as it was initially intended. The first draft of the plan was to only provide small farms for family farmers, however as time passed, and the price for the dam grew, the organizers came to realize that larger farms would be much more profitable and pay for the cost of the dam much sooner, than small farms. Thus the size of the farm plots grew, and grew until it was no longer for small family farmers, but for large corporate organizations [2]. Another issue that occurred, was that the federal government and the local one, both wanted to assist small farmers, but they both wanted to have control

of the project, as a result of this neither organization succeeded, and the family farms began to fail in favor to the larger corporate farms. One of the major causes for the failure of these smaller farms, was technology. As technology rapidly developed, the large farms could easily afford the new tools, that made them even more cost efficient, while a small family farmer could not even dream of catching up with the rapidly developing technology of agriculture tools [2]. The Columbia basin project came nowhere close to what it was initially to be, and as more time passes, antiquated decisions still hold, for example the government still supplies many farmers in the area with water at significantly subsidized prices.

Industry in the northwest was vital for the development of the population centers in the region. Large industries create a high demand for workers, this demand for workers makes the northwest a better destination for potential migrants, who would have a job in the region. This means that the large number of industries would have been a large draw for the thousands of Americans who were moving to the west. One of the major industries that was created in the northwest was the aluminum smelting. The aluminum mills required a huge amount of electricity to run, and that was exactly what the dams on the Columbia river would provide. Because the dams created such a surplus of electricity, and the rivers could be used to export the aluminum, the locations around the dams became the perfect location for these aluminum mills. The northwest became such a large area for aluminum production that it was the largest aluminum exporter in the country. These huge industries caused a huge draw for more people. Because that was a great amount of possible profit in the aluminum industry, but they needed many more employees, the number of people coming to the northwest grew greatly. These major industries were a major kick start to the economy of the northwest, as well as a jump start in the population of the region. All of this resulted from the industries that sprouted up around the Columbia river, and the industries were drawn to the Columbia because of the cheap electricity that the river dams offered. Because of this the dams helped kick start the economy and the population of the region. Along with the draw of industries, the dams themselves provided thousands of jobs. During the peak of construction of the Grand Coulee dam, there was approximately 8,800 workers, only some of those were directly construction workers, the others were for telephone, and water and other resources that were necessary for the small city of people that came to work

on the dam [6].

The largest of the dams along the Columbia river was the Grand Coulee dam, which began construction in 1935 and was completed in 1941 [10]. The completion of the dam had a large effect on the industries in the region, in particular the aluminum industry. When the dams along the river were completed, the federal government encouraged aluminum companies to construct aluminum smelters around the dam, in order to have a use for the vast amounts of energy that was produced [4]. Many aluminum smelters were drawn to the Northwest, by the invitation from the federal government and the whole sale price of electricity. They were also drawn to the accessibility to aluminum consumers, such as aircraft producers [5]. However, this draw of industry was not a permanent one, as time has passed, the price of electricity has become less important in the process of aluminum production, and has been swapped for a favor of being located closer to the source of the aluminum ore, and reduce transpiration costs. Because the northwest does not produce any of its own aluminum ore, the aluminum industry has begun to move to location where the ore is more readily available, such as china [5]. However, these aluminum smelters were a critical part in drawing in industries to the northwest, and support the economy of the developing region, and these industries were only drawn because of the cheap electricity that was provided by the dams.

When viewing the time of completion for the Grand Coulee Dam (1941), and the census data for Oregon around that time, there is a clear jump in population the few years after the dam is completed. The population jumped 114,000 people in one year, which previous years was only showing a growth of about 20,000 people. This sudden growth is 5.7 times the average growth rate of the time, and occurs the year following the construction of the dam [7]. Although the population of Oregon has grown much more than what it used to be, and the jump present at that time appears less influential, the total population at the time was only 1,107,000, so this jump represented about %9.71 of the population at the time. This is an undeniable growth of people, which occurred directly after the completion of the largest dam along the Columbia river. Some of these people came because of the offered land for small farmers, as the dam provided water to more than 2,000 farms [13]. And many of the people form the population boom would be resultant of the entrance of the aluminum

industries, which employed more than 2,000 employees in Oregon alone. It can be reasoned that the Grand Coulee dam was a major cause for the influx of people.

Unfortunately these industries were placed around the river dams because they required immense amounts of electricity, which then made it less available for others. Another unfortunate side effect of these industries, in particular the aluminum smelters, is that they produce an extreme amount of pollution. Although these industries created many job positions, and greatly helped the economy of the region, they were also extremely damaging to the natural environment. These industries that were drawn to the river dams, were damaging an environment that was already hurt by the construction of the dams themselves. All of these industries were very important in their own way for the legacy of the northwest and the Columbia river, but they all were also very damaging to an already damaged environment. And as these realizations have come to be more prevalent in today's society, these industries are moving elsewhere, and leaving the northwest. This departure of the industries, means that the power of the hydroelectric plants were not going to use, and so now these dams cannot provide their maximum amount of energy, and are becoming much less useful. A few of the dams along the rivers have been re-proposed to supply electricity to data centers. Data centers are the new major industry, that needs huge amounts of electricity to run, and the dams are one of the only sources for them. The benefit that data centers have over other historically conventional industries, is that location does not matter in any way. However, data centers are not needed on every dam along the river, only one or two of the dams along the rivers will be used for data centers. This means that there are many more river dams that will lose most of their use, as public electricity can be sourced from elsewhere, and the major electricity consumers leave.

The aluminum smelters were in themselves a large source of environmental damage. Because of the process of extraction the aluminum metal creates a large amount of greenhouse gases, which is then released into the atmosphere. When people are already disapproving of the dams on the river for disrupting the natural environment, the fact that more pollutant-producing industries came to the region, angered many of the environmentalists. The aluminum industries that came to the region produce hundreds of tons of greenhouse gases a year. Some of which are orders of magnitude more damaging than common carbon dioxide [1].

Just the fact that these dams enticed the aluminum smelters to come to the northwest was a direct cause of the destruction of the environment, more so that the dams were already causing to the environmental damage. Although these industries that were drawn to the northwest because of the dams had a significant footprint on the economy of the northwest, and were able to bring thousands of workers to the region, the overall environmental impact was disastrous [4]. The aluminum smelting plants produced immense amounts of pollution, and because they were being provided electricity at a whole sale rate, it was possible for them to produce aluminum at a very rapid rate and for much less. And now as time has passed, and the aluminum smelters are favoring more profitable locations for their plants, the plants in the northwest are disappearing, and becoming obsolete, leaving their permanent mark on the global environment, and moving to a new land where they can start anew.

When the planing begin for the dam construction along the Columbia river, the native Americans were not taken into account in any way. Because of this several native American villages were torn up in order for the dams to be constructed, and with out much more than a though for the tribes that resided in those villages. At most they were provided with some temporary shelter, and at least they were provided with nothing [16]. Many families were evicted from their traditional homelands and forced to move to new lands, without being compensated for anything. The most that the government has done is designate several fishing sites along the river to make up for the traditional locations that were flooded by the backwater of the dam reservoirs. The construction of the dams displaced dozens of people, across several tribes, and the non-native Americans who were displaced by the dam construction were treated in a much different manner. The non-native Americans were provided permanent homes by the government, along with assistance in relocation [16]. This is a clear distinction to the native tribes that had lived on these lands for generations, who where forced to move without much consideration and with little to no compensation for the loss of their historical tribal home. The view of the planners tasked with the construction of the dams was all focused on the economical gain that could be achieved, and they did not consider the natural environments that they would be destroying, or the traditional lands of natives that would be flooded. These dams were only created for the interest of the investors, and with the price tag that they cam with it makes sense that the primary view of the dam

is how soon it can pay off the price. However, this allowed the environment and the people how lived off of the river in its current state to become neglected by the project planners.

The dams have had a very large and indisputable impact on the native fish populations along the Columbia river, and its tributaries. The dams cause it to be extremely difficult for many anadromous fish species to travel up and down from their native spawning grounds and to the ocean. Despite the sheer magnitude of money that has been poured into creating ways for the fish to navigate around the dams, the damage has already been done, and cannot be undone. Even as the powerful companies that are profiting from the dams attempt to make amends by constructing fish hatcheries along the rivers, this is no substitute for the original strand of fish that developed in the rivers and tributaries. Although there have been continued development to find new ways to help fish to swim past the dams. However, any method that is used for moving fish around the dams can never be as good as the natural river was, as that is what the fish evolved to do, and when this path was disrupted, there is almost nothing that can substitute that. The two major fish species that live in the Columbia river area are the salmon and steelhead. The first issue is that the dams block passage of the fish between their spawning habitat and the ocean. Many major dams have included fish ladders or other mechanisms to assist in transporting fish around the dams, but there are many more dams that do not include some form of fish passage, and because of this 55% of the once accessible spawning area has been blocked off permanently by dams [9]. The reservoirs that were created by the dams, can also be equally dangerous to the salmon and steelhead. Because dams cause the flow of water to slow, the temperature of the water can rise to dangerously high levels, and can even become so hot that it is lethal to the fish [9]. The variant flow of water can be deadly for the fish as well. Because the dams further upriver can cause the water level to rise and fall, the fish eggs can be shifted closer to the surface. Then when the dam reduces the throughput, the water level falls, and these fish eggs have been stranded in the open air, where they fish inside will die [9]. The natural environment that these fish evolved for has been completely destroyed by the dams. Even though the dams have attempted to make amends, by constructing fish hatcheries, however these have actually resulted in the diluted genetic lines, which is also harming the fish populations.

The dams along the Columbia River have been of great importance in the years around

their construction. The dams themselves were a huge provider of employment during construction, then they drew a large number of industries which also provided large numbers of jobs. Both of these were extremely influential on the economy of the northwest at the time, and helped draw thousands of people to move to the northwest. These dams also assisted in the creation of much of the agricultural area in the northwest, through irrigation and several programs to provide land to new farmers. However, the dams were also a great cause of damage to the natural environment, and to some of the people of the northwest. The native Americans were ignored, and displaced by the construction of the dams, and a multitude of different habitats were destroyed, and particularly the salmon and steelhead fish populations have lost much of their traditional habitats, and routes. Although the dams were extremely important when they were created, as they have provided vast amounts of utility, they have begun to become obsolete with time. The major industries that needed the electricity are moving away and farms have become extremely efficient at utilizing very little electricity. And the region has grown enough that the economy can be sustained through other means. Now the dams are mainly damming the fish populations. Because of this gradual reduction in the utility of the dams, some of them can be removed. However, some dams should always remain standing, as they still have great utility in flood prevention, and water management, but the number of dams that currently stands is no longer necessary.

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