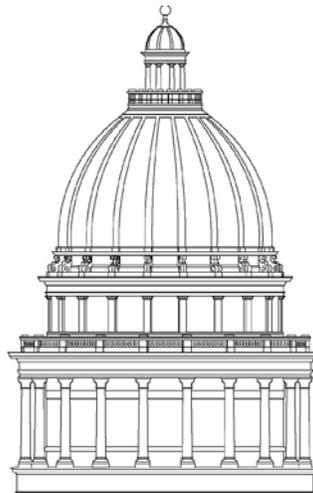


REPORT TO THE
UTAH LEGISLATURE

Number 2011-14



**A Performance Audit of
The Utah Division of
Wildlife Resources**

November 2011

Office of the
LEGISLATIVE AUDITOR GENERAL
State of Utah



STATE OF UTAH

Office of the Legislative Auditor General

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Senator Ross I. Romero • Representative David Litvack

JOHN M. SCHAFF, CIA
AUDITOR GENERAL

November, 2011

TO: THE UTAH STATE LEGISLATURE

Transmitted herewith is our report, **A Performance Audit of the Utah Division of Wildlife Resources** (Report #2011-14). A digest is found on the blue pages located at the front of the report. The objectives and scope of the audit are explained in the Introduction.

We will be happy to meet with appropriate legislative committees, individual legislators, and other state officials to discuss any item contained in the report in order to facilitate the implementation of the recommendations.

Sincerely,

A handwritten signature in black ink that reads "John M. Schaff" with a stylized flourish at the end.

John M. Schaff, CIA
Auditor General

JMS/lm

Digest of A Performance Audit of the Utah Division of Wildlife Resources

The Division of Wildlife Resources (DWR) is part of the Utah Department of Natural Resources. It is the primary state agency responsible for the management, protection, and conservation of Utah's fish and wildlife resources. The division is further divided into six sections which include: wildlife, aquatics, habitat, law enforcement, administration, and outreach. However, the focus of this audit was limited to the aquatics, wildlife, and habitat sections.

Specifically, we identified several inefficiencies within the Aquatics Section of DWR which are addressed in Chapters II and III. In Chapter IV, we address two wildlife issues. First, our office was asked to determine if the division's practice of allocating limited-entry hunting permits, to be auctioned by conservation groups, diminishes the opportunity for Utah families to draw a permit to participate in the hunt for big game species in the state. Second, we were asked to determine if the proceeds from the sale of these permits were re-invested into conservation efforts by the division, as required by law.

DWR needs to improve their process for assessing the costs of hatchery fish production to determine where savings can be derived. Specifically, DWR needs to:

- Better track the costs of production across the hatchery system to aid in decision-making. Our review of surrounding states suggests some states better track hatchery related costs.
- Evaluate where hatchery production costs can be reduced, such as shifting production from less efficient hatcheries to more efficient hatcheries.
- Determine whether each species of fish produced is necessary and if lower cost options are available that can fulfill a similar management need or biological role.

Chapter I: Introduction

Chapter II: Tracking Hatchery Cost Data Will Improve Decision- Making

**Chapter III:
Efficiency of State
Fish Hatchery
Operations Needs to
Improve**

Conducting these analyses will help DWR better work within the limits of existing resources to meet angler demand, rather than subsidize the Aquatics Section with revenues from hunting. We commend the division for recognizing opportunities for improvement, when such areas were communicated by the audit team during the audit. Further, the division reports that they have already begun working on several of the recommendations listed in this report.

More can be done to reduce the costs associated with running the state fish hatchery system. Over the last three years, DWR produced approximately 50 percent more eggs and more fish than were planned for to stock the state's waterways. In addition, DWR has given away millions of fertilized eggs to a variety of fish hatcheries since 2006. It is important that DWR focus on reducing the level of waste generated through egg and fish overproduction. Specifically, division management should limit the number of excess fish eggs given to other states, reduce the amount of unused eggs that are destroyed, scale back the quantity of fish that are grown unnecessarily, and increase oversight of the Aquatics Section by developing an enhanced, long-range planning process.

We note that the primary focus of Chapters II and III is to assist DWR in addressing inefficiencies identified at state hatcheries. We believe that there are a number of opportunities for the state hatchery system to improve its process and reduce costs, while at the same time maintaining angler demand by sustaining the state's award-winning fisheries.

**Chapter IV:
Conservation Permits
and Cooperative
Wildlife Management
Units Appear
Beneficial**

Our limited review of conservation permits concluded that public hunting opportunities were not significantly impacted by the practice of allocating permits to conservation groups. Allocating a small number of permits to conservation groups had an impact of less than one percent in every example given in this report. We also found that the conservation permit program appears to provide a benefit to the public by promoting habitat preservation and species conservation.

Utah's Cooperative Wildlife Management Unit (CWMU) program, which was also reviewed in Chapter IV, has been providing landowners with indirect financial incentives in exchange for limited public access to private land for hunting. Such incentives have also benefited public hunting opportunities by conserving valuable wildlife habitat. Despite these benefits, the division should consider reviewing this program to ensure that the public receives a reasonable share of the antlered permits.

REPORT TO THE UTAH LEGISLATURE

Report No. 2011-14

A Performance Audit of The Utah Division of Wildlife Resources

November 2011

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Table of Contents

	Page
Digest	i-
Chapter I	
Introduction.....	-1-
The Division Has a Wide Range of Responsibilities	-1-
DWR is Funded by Several Revenue Sources	-2-
Audit Scope and Objectives	-4-
Chapter II	
Tracking Hatchery Cost Data Will Improve Decision-Making.....	-7-
DWR Has Not Tracked Essential Hatchery Cost Data to the Extent of Other States.....	-8-
Costs Should Be Considered When Determining Where Fish Are Produced.....	-10-
Some Types of Fish Could Be Replaced with Lower-Cost Alternatives.....	-13-
Recommendations	-16-
Chapter III	
Efficiency of State Fish Hatchery Operations Needs to Improve.....	-17-
Waste Identified in Egg Production is Concerning.....	-17-
More Fish Are Grown Each Year Than Required by Quota.....	-22-
Enhanced Planing Can Reduce Excess Costs.....	-23-
Recommendations	-26-
Chapter IV	
Conservation Permits and Cooperative Wildlife Management Units Appear Beneficial ...	-27-
Conservation Permits Have Little Impact On Public Hunting Opportunities	-27-

Proceeds From Conservation Permit Sales Enhance Wildlife Habitat.....-28-

CWMUs Promote Hunting Opportunities and Wildlife Habitat.....-30-

Recommendation-33-

Appendix.....-35-

Agency Response.....-39-

Chapter I

Introduction

The Division of Wildlife Resources (DWR) is part of the Utah Department of Natural Resources. It is the primary state agency responsible for the management, protection, and conservation of Utah's fish and wildlife populations. The division is further divided into six sections which include: wildlife, aquatics, habitat, law enforcement, administration, and outreach.

The Division Has a Wide Range of Responsibilities

The Utah Division of Wildlife Resources has many responsibilities including:

- Administering the state's hunting and angling programs
- Maintaining and restoring wildlife habitat
- Managing wildlife populations in the state
- Restoring populations of native species
- Supplementing populations of sport fish
- Mitigating invasive species
- Providing law enforcement
- Educating the public about safety and conservation

The focus of this audit was limited to the aquatics, wildlife, and habitat sections. As part of the responsibility to maintain fish populations, mitigate threatened and endangered fish species, and administer the angling program, the Aquatics Section supplements the state's waters with sport fish and native fish. To accomplish these objectives, aquatics operates 12 fish hatcheries which produce approximately 1 million pounds of fish annually.

The Aquatics Section raises fish from eggs up to stockable-size fish. Hatchery employees take eggs from both captive brood stock (adult fish raised in hatcheries for the purpose of egg production) and wild fish. These eggs are incubated and shipped to hatcheries around the state to be hatched and raised. Stocked fish range in size from 2-inch

The Aquatics Section operates 12 fish hatcheries and produces more than 1 million pounds of fish annually for the purposes of supplementing the state's waters with sport fish and native fish.

fingerlings up to 10-inch catchable fish. The size of the fish stocked depends on both the biological needs of the water and agency-assessed angler demand.

DWR has shifted its focus to producing larger, but fewer fish. Over the past 5 years, the 12 state hatcheries have increased the pounds of fish produced by more than 400,000 pounds. In contrast, the number of fish produced has actually decreased by more than 300,000 fish. The agency attributes this shift in focus to both predation concerns and angler demand.

The purpose of the Wildlife Section of DWR is to manage and conserve the state's wildlife and to administer hunting opportunities. In Chapter IV, two DWR wildlife programs are discussed: the conservation permit program and the Cooperative Wildlife Management Unit (CWMU) program.

The conservation permit program was developed to provide a dedicated source of funding for habitat restoration and wildlife transplant projects that benefit Utah's wildlife by auctioning permits for limited hunting areas. The CWMU program was developed to provide public hunting opportunities on private property and conserve wildlife habitat by compensating land owners, who participate in the program, with permit vouchers.

DWR Is Funded by Several Revenue Sources

The Division of Wildlife Resources is funded by a combination of several different sources. Funds generated from the sale of fishing and hunting licenses are placed in a single restricted account and utilized by all sections within the division. In fiscal year 2010, restricted funds made up roughly 45 percent of the agency's funding.

A combination of federal funds, general funds, and dedicated credits comprised the remainder of the agency's revenue in fiscal year 2010. Federal funds comprised about 31 percent of the division's total revenue. Many of these federal dollars came to the division in the form of a three-to-one match through federal aid programs like the Dingell-Johnson Sport Fish Restoration Act and the Pittman-Robertson Wildlife Restoration Act. These programs generate funds

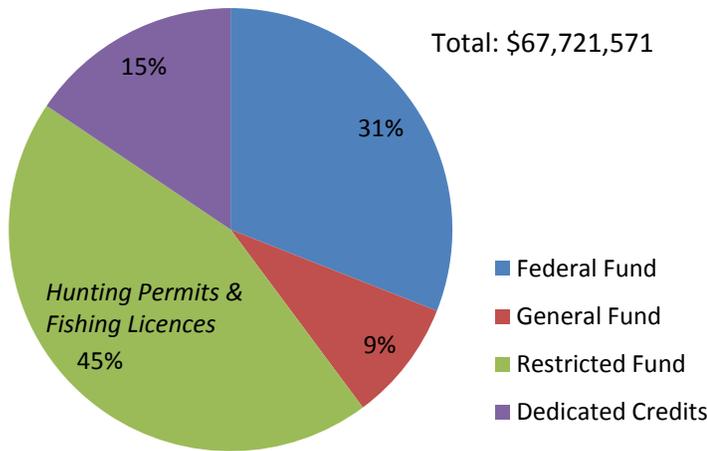
The Wildlife Section manages and conserves the state's wildlife and administers hunting opportunities in the state. Funding for these efforts is supplemented through CWMU and conservation permit sales.

Federal funds comprise 31 percent of the division's total revenue

by placing an excise tax on fishing and hunting equipment sales. Thus, between restricted and federal funds, the majority of the agency's functions were funded by hunters and anglers. Dedicated credits, including donations and funds generated through cooperative projects with other organizations, provided about 15 percent of the agency's revenue. The final 9 percent of revenues came from the General Fund, which the Legislature has appropriated for programs including coyote removal, quagga and zebra mussel awareness, and wildlife depredation mitigation. In total, the agency collected \$67,721,571 in revenue for the 2010 fiscal year. Figure 1.1 highlights the breakdown of DWR funding.

A significant portion of DWR's functions are funded by hunters and anglers through permit and license sales.

Figure 1.1 DWR Revenue Types – FY 2010. DWR operations are paid for by four primary funds. Restricted fund revenue is largely comprised from the sale of hunting permits and fishing licenses.



Source: DWR Financial Report (rounded).

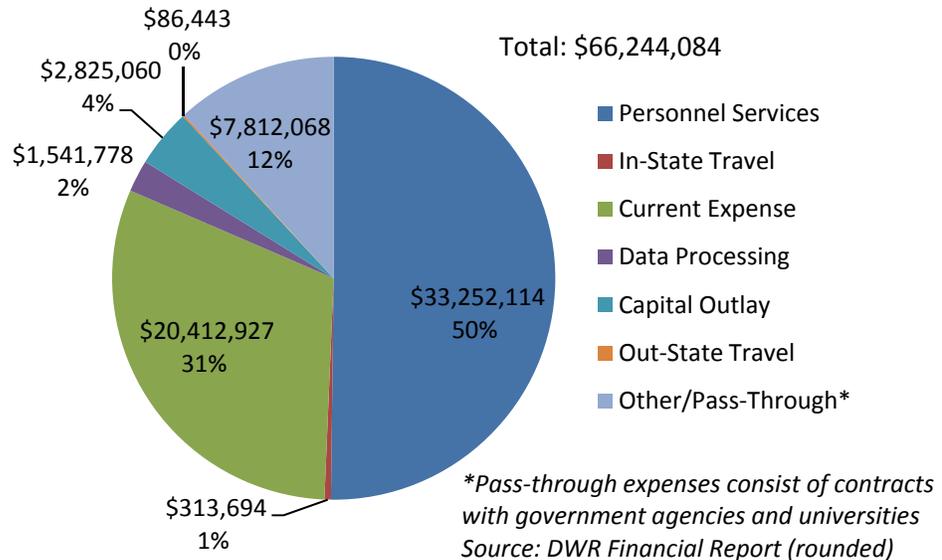
As shown in Figure 1.1, a significant portion of DWR's revenue was funded by hunters and anglers through restricted funds. While revenue is shared between the Wildlife and Aquatics Sections from license sales, DWR reported that the Aquatics Section had an operational shortfall of approximately \$2.2 million, which was largely subsidized with hunting revenue.

DWR reported that the Aquatics Section had an operational shortfall of approximately \$2.2 million in 2010.

Personnel comprise just over 50 percent of DWR's total expenses.

Figure 1.2 shows how the division's expenses are divided into several categories, with personnel services being the largest category, encompassing just over 50 percent of total expenses in 2010.

Figure 1.2 DWR Expenses by Classification– FY 2010. Roughly half of all DWR expenditures are comprised of personnel services. (Note: revenue in excess of expenditures is invested with the State Treasurer in a restricted account.)



Audit Scope and Objectives

We were asked to determine if the use of conservation permits diminishes public hunting opportunities and if the proceeds are used appropriately. We also reviewed the efficiencies of the Aquatics Section.

The Legislature asked the Legislative Auditor General to determine if the division's practice of auctioning limited-entry hunting permits by conservation groups diminishes the opportunity for Utah families to draw a permit to participate in the hunt for big game species in the state. We were also asked to determine if the proceeds from the sale of these permits were reinvested into conservation efforts by the division, as required by law.

In addition, the Audit Subcommittee authorized the Legislative Auditor General to review the major functional responsibilities of the division and identify areas where efficiency and effectiveness can be improved. During the course of the audit, our risk assessment led us to identify several inefficiencies within the Aquatics Section of DWR. The following points identify the specific audit objectives:

- Determine if the sale of conservation permits is impeding the opportunity for a family or individuals to draw a big game permit.
- Identify ways that the Aquatics Section can reduce its dependence on supplemental revenues from the sale of hunting licenses.

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Chapter II

Tracking Hatchery Cost Data Will Improve Decision-Making

The Division of Wildlife Resources (DWR) needs to improve their process for assessing the costs of hatchery fish production to determine where savings can be derived. Specifically, DWR needs to:

- Better track the costs of production across the hatchery system to aid in decision-making. Our review of surrounding states suggests some states better track hatchery related costs.
- Evaluate where hatchery production costs can be reduced. For example, we found in one possible scenario, that DWR could save approximately \$163,000 annually by shifting production from one inefficient hatchery to other more efficient hatcheries.
- Determine whether each species of fish produced is necessary and if lower cost options are available that can fulfill a similar management need or biological role.

Conducting these analyses will help DWR better work within the limits of existing resources to meet angler demand, rather than subsidize the Aquatics Section with revenues from hunting. We commend the division for recognizing opportunities for improvement, when such areas were communicated by the audit team during the audit. Further, the division reports they will begin work on several of the recommendations listed in this report.

Hatchery Production Has Nearly Doubled Over the Last Five Years. DWR spent close to 45 percent more over the last five years to produce the same number, but significantly larger fish in 2010 than in 2006. Figure 2.1 shows five years of cost and production data at Utah hatcheries.

DWR spent close to 45 percent more over the last five years to produce the same number but significantly larger, fish in 2010 than in 2006.

Figure 2.1 Hatchery Production and Cost Summary 2006-2010. The pounds of fish produced have increased over the last five years while the total number of fish stocked stayed roughly the same.

Year	Pounds of Fish Produced	Number of Fish Stocked	Yearly Budget Spent	Yearly Cost per Pound	Average Length (in.)
2010	1,334,889	8,720,664	\$4,974,059	\$3.73	7.3
2009	1,245,191	8,102,808	\$5,142,465	\$4.13	7.3
2008	1,040,430	7,092,069	\$3,890,681	\$3.74	7.1
2007	981,153	8,062,458	\$2,970,694	\$3.03	6.7
2006	910,712	9,052,920	\$2,754,168	\$3.02	6.3

Division management has discussed the possibility of raising the fee for fishing licenses to cover the Aquatics Section's operational shortfall. But, we believe the division should look first to increasing hatchery efficiencies.

As seen in Figure 2.1, Utah's fish hatcheries are producing more pounds of fish at a higher total cost. This increase in cost is caused by hatcheries raising larger sized fish as well as increases in feed costs and other variables. The increase in hatchery costs came at the same time the Aquatics Section saw an operational shortfall of approximately \$2.2 million. This shortfall has largely been subsidized with funds from the wildlife program. Division management has discussed the possibility of raising the fee for fishing licenses as a means to cover this shortfall.

We believe that the division should look first to increasing the efficiency of its hatchery process by adopting the recommendations we address in this report before considering the necessity of increasing license fees. We do recognize however, that cost savings gained through efficiency improvements alone may still leave the aquatics programs underfunded.

DWR Has Not Tracked Essential Hatchery Cost Data to the Extent of Other States

DWR needs to better track the cost of fish production across the hatchery system. We spoke with a number of states in the region but discovered that few states had programs comparable to Utah. However, Colorado and Wyoming were able to provide us with a list of activities that they track, essential to their hatchery production that Utah could not. DWR should reference these states when developing and tracking fish production costs to provide managers with the data needed to more efficiently run Utah's hatchery program.

Colorado and Wyoming were able to provide cost activity data essential to their hatchery production that Utah could not.

Hatchery Comparisons Require Reliable Data

Throughout the audit, it was difficult to identify accurate hatchery costs. For example, we attempted to compare DWR's cost for hatchery egg production against the cost of purchasing eggs from private hatcheries. However, we found that DWR had not developed sufficient data to enable a fair and reliable comparison of hatchery production costs.

We are not confident that the division has fully evaluated the cost-benefit of decisions made regarding the state's aquatics program. Because DWR has not adequately or routinely tracked production costs, calculations in the examples provided in this report reflect only our best estimate. We recommend that DWR work to capture the fully allocated cost of running the state hatchery system so that improvements in efficiency can be identified and adopted.

Two States Have Developed Better Cost Tracking Techniques

Two states we reviewed, Colorado and Wyoming, track key data in their aquatics programs: The Colorado Division of Wildlife (DOW) and the Wyoming Fish and Game Department monitor costs by tracking a number of activities critical to each step of the hatchery process.

Hatchery managers in Colorado have adopted a process of tracking critical activities which was reinforced in a legislative audit that called for greater accountability to taxpayers for fish production. We believe that Utah's hatchery system should do the same. The following is a list of hatchery activities that Colorado tracks but Utah does not:

- Fish Feeding
- Cleaning
- Count/Sort/Move
- Egg Handling
- Transport and Planting
- Treat Disease/Inspect
- Remove Dead Fish
- Pond and Raceway Preparation
- Domestic Spawning
- Wild Spawning

Colorado's Division of Wildlife uses the gathered information to calculate costs associated with raising and stocking fish. From this data

DWR has not developed sufficient data to enable a fair and reliable assessment of hatchery production costs.

Colorado Division of Wildlife and Wyoming Fish and Game track hatchery costs more effectively than Utah's DWR.

staff were able to provide us with: brood cost per pound, catchable cost per pound, and sub-catchable cost per pound. More importantly, Colorado is further enhancing accountability by amending its timesheets to capture these various costs per pound by individual fish species. We believe that information, such as that gathered in Colorado, could provide considerable insight to Utah hatchery managers in assessing costs.

In addition to Colorado, we found that the Wyoming Fish and Game Department also does a better job of tracking costs than Utah does. Hatchery employees complete a daily activity report which includes the following activities:

- Aquatic Habitat Maintenance
- Fish and Wildlife Rearing
- Fish Egg Collection
- Stocking Restoration
- Stocking Maintenance
- Put-and-Take Fish Stocking

By tracking hatchery activity costs similar to those tracked in Colorado and Wyoming, DWR management can identify activities that are critical for enhancing operational efficiencies in the hatchery process. In our opinion, DWR has not been utilizing cost data to guide management decisions. We believe that once the division knows its hatchery activity costs, aquatics managers should be able to better assess each species' value, determine if privatization options can meet fish and egg needs, and ultimately lower the cost of producing fish.

Costs Should Be Considered When Determining Where Fish Are Produced

DWR should evaluate which hatcheries produce fish at the lowest cost and consider shifting production to these locations. For example, DWR could have saved an average of \$163,000 annually over five years, by shifting production from one inefficient hatchery to other hatcheries. DWR's evaluation should include determining where to grow brood stock and stockable fish, as well as assessing the state's need for each hatchery in the system. For example, after mitigating for

The Colorado Division of Wildlife collects data which allows it to calculate brood cost per pound, catchable cost per pound, and sub-catchable cost per pound.

DWR should evaluate which hatcheries produce fish at the lowest cost, and consider shifting production to these locations.

disease concerns, the division could consider the option of purchasing fish eggs from out-of-state vendors rather than spawning them in-state. We believe that DWR should determine if there are opportunities to reduce the number of hatcheries in operation, as some hatcheries produce fish at less cost than others do.

Some Hatcheries Are More Cost-Efficient than Others

Utah’s hatcheries vary widely in the cost to produce fish. We evaluated five years of fish production data to determine operating costs at each hatchery. The state’s hatcheries range in cost from \$2.12 to \$5.13 per pound of fish. Given that some hatcheries are more cost-efficient than others are, the division should consider whether all 12 fish hatcheries are needed to meet state fish stocking needs. This assessment is especially relevant given DWR’s planned reduction in fish production because of budget cuts. Figure 2.2 highlights the production differences among hatcheries over the last five years.

The cost of fish production in Utah’s state hatcheries ranges from \$2.12 to \$5.13 per pound of fish. Given this wide range, the division should consider whether all 12 fish hatcheries are needed.

Figure 2.2 Analysis of Utah Fish Hatcheries in Operation Shows a Wide Range in Five Year Average Costs. This figure shows that of the seven state hatcheries operating from 2006-2010 the average cost per pound varied widely.

Hatcheries	Pounds of Fish Produced	Number of Fish Stocked	Hatchery Expenditures	Cost Per Pound	Cost Per Fish	Average Pound Per Fish Produced
Loa	135,708	461,236	\$287,106	\$2.12	\$0.62	0.29
Fountain Green	219,398	1,684,742	\$495,435	\$2.26	\$0.29	0.13
Kamas	164,035	965,195	\$417,343	\$2.54	\$0.43	0.17
Glenwood	140,402	1,126,277	\$379,371	\$2.70	\$0.34	0.12
Whiterocks*	154,022	1,356,652	\$560,997	\$3.64	\$0.41	0.11
Mantua	92,320	807,347	\$367,917	\$3.99	\$0.46	0.11
Mammoth	57,653	329,975	\$295,974	\$5.13	\$0.90	0.17

* Whiterocks hatchery numbers are based on three year averages of production instead of five year averages due to hatchery reconstruction.

Figure 2.2 captures only those hatcheries in production for the majority of the five-year period that we reviewed, and those where the production was primarily stockable fish, with the exception of Whiterocks hatchery. As shown in Figure 2.2, Loa hatchery had the lowest cost per pound while Mammoth Creek hatchery had the

highest cost per pound. Mammoth Creek also produced the fewest pounds of fish. We believe that the division should address the disparities between hatcheries by maximizing production at lower cost hatcheries. This step may include eliminating higher cost, lower producing facilities that are not necessary to meet the state's stocking needs.

Shifting Production Locations Can Reduce Costs

We examined the option of shifting all the production from the state's highest cost hatchery to three of the state's lowest cost hatcheries. Acknowledging the limitations with this example due to the potential of spreading cold-water disease, which proliferates more quickly in crowded raceways, Figure 2.3 demonstrates what could result if the division made more cost-efficient decisions on where to produce fish.

Figure 2.3 Potential Cost Savings of Shifting Production from One Inefficient Hatchery. The division could reduce costs by relocating the least cost-efficient hatchery's total production to the three most cost-efficient hatcheries. Based on 2006-2010 production data, almost \$815,000 could be saved in a five year period (about \$163,000 annually.)

Hatchery	Cost Per Pound	Total Pounds Produced Over 5 Years	Total Production Cost
Current Hatchery:			
Mammoth Creek	\$5.13	288,266	\$1,479,872
Production Redistribution to Three Other Hatcheries:			
Loa	2.12	96,089*	203,708
Fountain Green	2.26	96,089*	217,160
Kamas	2.54	96,089*	244,065
Total Cost			\$664,933
Cost Savings			\$814,939

* Figures will not add due to rounding

As shown in Figure 2.3, if DWR relocated the Mammoth Creek hatchery production over the last five years, and produced the same pounds of fish evenly distributed among Loa, Fountain Green, and Kamas hatcheries, the state could have saved about \$163,000 annually. Although there would undoubtedly be additional transportation costs (not included in this analysis) and these hatcheries would need to have the capacity to produce the extra pounds, the total

DWR hatchery production costs could be reduced by shifting production from one inefficient hatchery to other more efficient hatcheries.

cost savings would still justify the shift in production. We believe that this example illustrates the division's need to assess where it is growing fish and attempt to manage production in a more cost-efficient manner.

DWR Should Consider the Costs of Raising Brood Stock

Raising brood stock at the most suitable location is another potential opportunity for hatchery savings that aquatics managers should evaluate. This evaluation should consider the cost savings of purchasing eggs out-of-state, thereby eliminating the need for brood stock, as other states, including Idaho, have done. DWR has chosen to decentralize the locations where brood stock are housed and produced. Brood stock fish occupy a considerable amount of space in hatchery raceways that could otherwise be used to maximize the production capacity of a hatchery. The result of this decentralization is that Whiterocks and Mantua hatcheries lose production capacity at their facilities because of housing brood stock fish. In the future, DWR management should evaluate the cost implications and long-term reduction in hatchery production capacity when making these types of decisions.

Some Types of Fish Could Be Replaced With Lower-Cost Alternatives

Once accurate cost data has been collected, DWR should use the data to determine whether each currently grown species of fish is needed. The agency will also need to evaluate whether purchasing fish and eggs from out of state vendors is warranted, and if lower cost alternatives to fish production exist. In addition, DWR should determine where triploid fish are needed in Utah's waters and if they are necessary in community ponds.

Triploid Fish Eggs Are More Expensive to Produce

Triploid fish are created by heat shocking or pressure treating fertilized eggs. This process produces sterile fish and is used as a management tool to control population size and to prevent hybridization between stocked fish and native cutthroat trout. The

Whiterocks and Mantua have lost production capacity due to the considerable space required to house brood stock at both locations.

Triploid fish eggs adds to production costs and should thus be used only when necessary.

triploiding process adds to production costs because fewer eggs survive. We believe that using this method as a management tool is valid. However, we would encourage the division to use this process only when necessary. Figure 2.4 shows the differences in cost per egg for all the species, both diploid (fertile) and triploid (sterile), at Egan Hatchery.

Figure 2.4 Cost per Egg by Species at Egan Hatchery. Egan Hatchery produced 14 different species of fish in 2010 including eight different varieties of rainbow trout.

Species	Fertilization Rate	Total Eyed Eggs	Cost Per Egg
Rainbow Trout (Strain 1)	78%	1,084,664	3.3¢
Rainbow Trout (Strain 1)*	57%	1,187,180	4.4¢
Rainbow Trout (Strain 2)	67%	1,078,237	3.8¢
Rainbow Trout (Strain 2)*	57%	1,275,115	4.5¢
Rainbow Trout (Strain 3)	79%	2,096,666	3.2¢
Rainbow Trout (Strain 3)*	64%	2,375,433	3.9¢
Rainbow Trout (Strain 4)	59%	112,973	4.3¢
Rainbow Trout (Strain 4)*	46%	208,974	5.5¢
Brown Trout	92%	1,003,400	2.8¢
Brook Trout	71%	1,800,669	3.6¢
Brook Trout*	52%	249,693	4.8¢
Lake Trout	54%	75,412	4.7¢
Tiger Trout	63%	1,924,596	4.1¢
Splake	63%	429,240	4.0¢
Total (Average)	65.80%	14,902,252	3.8¢
Strain 1 - Erwin/Sand Creek	Strain 2 - Gunnison River/Harrison Lake		
Strain 3 - Fish Lake/DeSmet	Strain 4 - Albino		
* Triploid			

As shown in Figure 2.4, Egan Hatchery alone produces a number of different species of fish, including five triploid species of trout. The differing strains of rainbow trout shown in Figure 2.4 are attributed to developing fish that resist different diseases such as whirling disease and coldwater disease. Different strains are also important for providing fish that can be spawned and stocked at different times in the year. Each of these strains has its own respective brood stock. Although the actual cost of the eggs themselves varies only slightly, the real expense is the cost of maintaining a wide variety of brood stock.

With each strain of fish, a separate brood stock is maintained, which can be expensive, but also important for thwarting diseases.

Maintaining Separate Brood Stock Entails Additional Costs

DWR should carefully consider the value added for each species of fish the state produces. Each additional species of fish involves extra costs to maintain brood stock. We believe that there are opportunities for the division to consolidate the range of sport fish provided. We question why DWR would produce a higher cost fish for a particular water, if a lower cost fish exists that fills the same biological niche.

For example, we were told that splake, a cross between a brook and a lake trout, could be replaced with tiger trout in most of the states waters where splake are stocked. These fish are among the more expensive that the state produces and DWR maintains a separate brood stock of lake trout for producing splake. We believe that once DWR can adequately track the production cost of each species, they will be in a better position to possibly take advantage of consolidating some species.

DWR Should Strive to Control Stocking Costs at Community Ponds

We identified a number of ways the division can reduce the stocking costs in community waters. Community waters, also referred to as put-and-take waters, are ponds throughout the state that DWR stocks with a variety of warm and cold water species. These ponds are some of the division's most expensive waters to stock, on a per acre basis, because all fish are raised to a catchable 10-inch length prior to stocking, while they are also some of the most heavily used. We question the need for producing triploid fish for stocking in community waters. Hatchery staff state that it is difficult to justify the added cost of producing a sterilized fish that will most likely be caught and removed from the water in a short period of time.

We encourage the division to assess the risks of potential cross-fertilization, which can be problematic for vulnerable native fish populations, while also finding ways to reduce costs. For example, DWR could stock diploid rainbow trout instead of the triploid albino rainbow trout, which has one of lowest fertilization success rates of any fish DWR produces. Both fish strains serve a comparable biological purpose, when cross-fertilization is not an issue. We believe that the division should stock community waters with fish that are the

Tiger trout are more cost effective to produce and can often serve the same function as splake, which are among the more expensive fish produced by DWR.

Community ponds are some of the division's most expensive waters to stock on a per acre basis because all fish are first raised to a catchable 10-inch length. The division should consider limiting stocking in these waters to those fish that are the lowest cost to produce.

least costly to produce while also safeguarding native fish populations in surrounding waters.

Recommendations

1. We recommend that DWR work to better track the fully allocated costs of the entire hatchery process to develop strategies to reduce the cost of the aquatics program.
2. We recommend that DWR shift fish production to lower cost hatcheries where possible and consider whether every hatchery in the state system is needed.
3. We recommend that DWR evaluate whether every species of fish the state produces is necessary.
4. We recommend that DWR limit the production and stocking of triploid fish to waters where they are needed for endangered species mitigation or management concerns, to reduce costs.
5. We recommend that DWR determine the cost, and impact of, decentralizing brood stock across the state hatchery system.

Chapter III

Efficiency of State Fish Hatchery Operations Needs to Improve

More can be done to reduce the costs associated with running the state fish hatchery system. It is important that the Division of Wildlife Resources (DWR) focus on reducing the level of waste generated through egg and fish overproduction. Specifically, division management should limit the number of excess fish eggs given to other states, reduce the amount of unused eggs that are destroyed, scale back the quantity of fish that are grown unnecessarily, and increase oversight of the Aquatics Section by developing an enhanced, long-range planning process.

Throughout the course of the audit, it was apparent that DWR management needs to both develop a more complete understanding of egg and fish production costs and recognize where inefficiencies in their process can be addressed. We acknowledge that DWR has recently taken steps to address many of our concerns in this audit.

We were told by DWR officials that fishing in Utah attracts a number of resident and nonresident anglers to the state's waters and that these individuals generate considerable revenue to the state. We recognize that the revenue created through sport fishing is important to the state as well as to local businesses. The purpose of this audit, as evidenced in our recommendations to DWR, is in no way meant to substantively diminish opportunities to fish or to negatively impact the quality of fishing in the state. Instead, the primary focus of the audit has been to address inefficiencies identified at state hatcheries. We believe that there are a number of opportunities for the state hatchery system to improve its process and reduce costs, while at the same time maintaining angler demand by sustaining the state's award winning fisheries.

Waste Identified in Egg Production Is Concerning

DWR has allowed a significant amount of waste to persist in the hatchery system for some time. Although we recognize that some

There are a number of opportunities for DWR to improve the state hatchery system processes and reduce costs. But, we recognize that DWR is already taking steps to address concerns raised in this audit.

degree of overage in hatchery production is to be expected for disease mitigation concerns, the degree of excess production we observed was troubling and needs to be addressed by agency management.

Over of the last three years, we found that DWR exceeded the number of fish eggs needed for stocking state waters by approximately 50 percent. This number is based on data collected from Egan hatchery, which provides the vast majority of the state's egg supply. These excess eggs were either given away to non-state entities or destroyed. In addition, several thousand pounds of excess fish were grown each year, which were unnecessary in meeting quotas for stocking Utah's waters. Poor planning and oversight appears to be the cause behind both excess egg and extra fish production. We believe that adopting a planning process, similar to what other states and federal hatcheries use, combined with improved oversight by division management, will help to reduce this excess production.

Overproduction of Fish Eggs Represents an Unnecessary Cost

The audit found that over the last five years DWR has given away approximately \$700,000 worth of viable fish eggs to non-state hatcheries. Egan hatchery collects over 20 million eggs each year for the purpose of stocking the state's waterways. These eggs are harvested from a group of adult brood stock fish whose exclusive purpose is egg production. Of the total green, or unfertilized, eggs harvested, an average of 71.6 percent are successfully fertilized to become a viable eyed egg.

We Estimated a Cost of 3.8 Cents per Fertilized Egg Using Agency Reported Data. Because DWR was unable to provide a reliable cost per egg, we used data from Egan Hatchery, the state's primary brood stock station in 2010-2011. We selected this year because the hatcheries primary activity was the production of fish eggs instead of producing stockable fish, which is the primary role of the state's 11 other hatcheries.

The calculation of 3.8 cents is used throughout the report as the average cost to produce a fish egg from 2006 to 2011. For the purposes of comparison, we discuss eggs primarily in terms of those eggs that are fertilized or eyed-up, and could grow into a stockable fish. Egan is responsible for the majority of the eggs produced for the

Utah produces approximately 50 percent more eggs and several thousand more pounds of fish than is necessary for stocking the state's waters each year.

Over the last five years, DWR has given away approximately \$700,000 worth of viable fish eggs to non-state hatcheries.

state. After incubation, eggs are then taken to other hatcheries across the state for hatching and rearing.

Although Egan is the primary egg producing facility in the state, two other hatcheries also maintain and harvest eggs from a limited number of brood stock. Additionally, the state collects eggs from a number of wild fish traps, where wild cutthroat are captured and spawned. As shown in Figure 3.1, the state has given away an average of 3.6 million eyed eggs per year to a variety of fish hatcheries dating as far back as 2006.

The state has given away an average of 3.6 million eyed eggs per year to a variety of fish hatcheries dating as far back as 2006.

Figure 3.1 State Cost of Eggs Shipped to Other Entities. DWR needs to plan better to avoid the overproduction of eggs.

Year	Total Green Eggs	Total Eyed Eggs	Eggs Shipped to Other Entities	Percent Shipped to Other Entities	State Cost of Eggs Given to Other Entities
2010-2011	22,325,282	14,902,252	3,735,789	25%	\$141,959
2009-2010	23,982,826	16,396,734	3,323,707	20	126,300
2008-2009	27,971,006	19,742,372	3,161,840	16	120,149
2007-2008	25,844,588	20,516,347	5,255,249	26	199,699
2006-2007	23,416,435	16,869,862	2,606,865	15	99,060
Totals	123,540,137	88,427,567	18,083,450	20%	\$687,171

As Figure 3.1 illustrates, 20 percent of the eyed eggs Egan hatchery produced over the last five years have been shipped to other entities.

Other Entities Benefit From Utah’s Excess Fish Eggs. We asked hatchery staff how, or if, the state is compensated for the eggs provided to outside entities. DWR expressed concerns for maintaining good relations with other states and stated that in the past, Utah has traded fish eggs with other states for other fish eggs or for wildlife desired for hunting. For example, we were told that the state of Kansas had traded wild turkeys to Utah in exchange for catchable trout. However, we were unable to identify any current arrangement or contract for the eggs DWR has given away in the last five years.

The recipients of these eggs in fiscal year 2011 are detailed in Figure 3.2.

Figure 3.2 Distribution of Utah’s Excess Fish Eggs for FY 2011.
DWR has given a significant number of extra eggs to non-state hatcheries

Egg Destination	Number of Eggs	Percent
Other States	699,683	5%
Federal Hatcheries	1,271,456	10
Tribal Hatcheries	1,265,970	10
Private Growers	498,680	4
Utah Hatcheries	9,165,491	71
Total Eggs Shipped (not including discarded eggs)	12,901,280	100%

As seen in Figure 3.2, a significant portion of the eggs the state produces are going to hatcheries that do not benefit Utah waterways. Twenty-nine percent of the total eyed eggs produced end up in non-state hatcheries. Some of these eggs, such as the more than 500,000 splake and tiger trout eggs transferred to another entity in fiscal year 2009, are among the more expensive eggs to produce. We are concerned that some revenues from the sale of licenses are being dedicated to the production of fish eggs that are not used in Utah waters or do not benefit Utah anglers.

Also concerning were discussions between Utah aquatics managers and the State of Arizona over a long term proposal for Utah to provide Arizona with rainbow trout eggs. Utah aquatics managers stated that they were considering charging Arizona approximately 2.5 cents per egg, which they believed was the cost to the state for production. We calculated a higher cost per egg of 3.8 cents, which only captures operations and maintenance costs and excludes capital costs. We believe that DWR needs to develop a better understanding of the full costs of egg production before pursuing any long-term arrangement with other states. In addition to our concerns about giving eggs to other states, the cost associated with viable fish eggs that are over-produced and then thrown away, is troubling.

Some of the eggs transferred out of state are among the more expensive to produce.

Discarded Eggs Are a Significant Cost to the State. We found that DWR has discarded 15.7 million viable fish eggs over the last three years. DWR staff told us that these surplus eggs were discarded because the eggs exceed both the stocking quotas of Utah’s waterways and the state hatcheries’ capacity to rear them. In addition, these were eggs that hatcheries in other state were not interested in taking. The end result was that these eggs were destroyed. Figure 3.3 shows the last three years’ history of discarded eggs and the associated cost to the state for this overproduction.

DWR has discarded 15.7 million viable fish eggs over the past three years which were in excess of stocking quotas and hatchery capacity.

Figure 3.3 State Costs of Discarded Eyed Fish Eggs. In addition to fish eggs that are given away to non-state entities, a substantial amount of viable fish eggs are simply thrown away.

Year	Total Eggs Produced	Eggs Discarded	Percent of Total Eyed Eggs	Cost at \$.038 Per Egg
2010-2011	14,902,252	2,000,972	13%	\$76,037
2009-2010	16,396,734	5,970,271	36	226,870
2008-2009	19,742,372	7,796,383	39	296,263
Total	51,041,358	15,767,626	31%	\$599,170

As shown in Figure 3.3, the state has discarded almost \$600,000 worth of viable eggs over the last three years due to overproduction. It is important to stress that these are the viable eyed eggs that are being discarded each year and exclude the eggs taken that were not successfully fertilized.

We asked if these discarded eggs are put to any other productive use in the hatchery process and we were told that typically these eggs are buried onsite, in a pit near the hatchery. We believe that this is a wasteful practice and question why these eggs were produced in the first place.

We contacted five other states to determine if discarding an average of 31 percent of eyed eggs was a typical practice in other hatchery systems. The audit found that two states will destroy excess green eggs collected from wild traps but rarely discard hatchery produced eyed eggs since brood stock eggs are not over produced in abundance. We spoke with no state that had overproduction levels comparable to Utah’s overproduction and conclude that the practice of

We spoke with no state that had eyed-egg overproduction levels comparable to Utah’s.

discarding eggs should be limited and that DWR managers should work to produce only those eggs that are needed. In addition to the concern of egg overproduction, whether they are given to other states or simply discarded, was that once hatched and grown, some of the fish exceed what is needed to stock Utah's waters.

More Fish Are Grown Each Year Than Required by Quota

We found that state hatcheries have produced more than 135,000 pounds of excess fish for 2009 and 2010 at a cost of over \$530,000. These fish exceed the established annual quotas based on quantities requested by regional biologists, but are still stocked throughout the state. We acknowledge that these fish are not wasted, as they are still stocked in state waters. The volume of excess fish produced, however, highlights the need for better planning, especially amid difficult budgetary times. DWR only provided us with data as far back as October 2008, so it is unclear how long excess production has gone on and what the cost to the state has been.

Figure 3.4 shows the pounds of fish produced and the corresponding production cost per pound.

Figure 3.4 State Cost of Extra Fish Produced in 2009 and 2010. The state allows excess eggs to hatch which creates more fish than are required by quota for the state's waters.

Year	Total Non-Brood (Pounds)	Cost Per Pound	Cost of Excess Fish
2010	70,260	\$3.73	\$262,070
2009	65,055	\$4.13	\$268,677
Total	135,315		\$530,747

From 2009 to 2010, DWR produced 135,000 pounds of fish above quota, at a cost of \$530,747.

In the two years DWR has fully tracked this data, the state has produced \$530,747 worth of excess fish. This number was calculated by multiplying the state's average annual cost per pound to produce a fish by the total pounds of non-brood stock fish that were grown above regional quotas. Brood stock were identified in DWR reports and eliminated from this analysis. A brood fish is identified as any extra fish whose reported length is longer than 10 inches. Since DWR

does not raise stockable fish larger than 10 inches, we determined that all larger fish were brood stock that were no longer needed by the hatchery for producing eggs. Since there is no way for the agency to eliminate excess pounds of fish resulting specifically from aged brood stock, we did not include these brood pounds in our analysis of excess fish.

Although we were told that extra fish do not typically hurt the waterway and in some cases add to the quality of fishing, we believe that the cost associated with Utah's excess fish should be better managed. For example, in 2010, Wyoming had 34,000 excess fish totaling only 1,100 pounds, compared to Utah's 70,000 pounds of excess fish at a cost of \$262,070. In addition, Wyoming stocks excess fish as small fingerlings to avoid additional costs of raising larger fish in the hatchery.

When we discussed the issue of excess fish and fish eggs with DWR management, they were unaware of the actual costs and volume of overproduction. We believe that management needs to exert greater control over state fish hatchery production and work to reduce the amount of overage. Better planning for future brood stock needs is important for estimating long-range fish requests and safeguarding taxpayer dollars. One strategy for achieving these improvements is developing a three to five year planning process similar to what is used in other states and federal hatcheries as well as increasing oversight of the Aquatics Section to see that the plan is executed.

Enhanced Planning Can Reduce Excess Costs

We spoke with other states and federal hatcheries to determine acceptable levels of overage for both egg and fish production. As previously discussed, the audit determined that Utah produces an abundance of excess eggs and fish. We believe that the cause of this problem is the lack of an adequate, long-range planning process seen in other hatchery systems.

Hatcheries' Planning Process Needs Improvement

DWR egg production exceeds what is needed at state hatcheries by approximately 50 percent, meaning that about half of all eyed eggs

In 2010, Wyoming Fish and Game produced 1,100 pounds of excess fish. In contrast, Utah, in the same year, produced 70,000 pounds of excess fish.

The federal hatchery system obligates 95 percent of the eggs that it produces.

produced are unobligated. The unobligated eggs have either been destroyed or given to other states. In contrast, we were told that federal egg producers obligate 95 percent of their eggs to hatcheries across the United States. We believe that the state can do better to reduce excess egg production and we recommend that DWR adopt a more comprehensive three to five year plan to assess egg needs. This plan should account for regional biologists' stocking requests far enough in advance that fish hatchery managers can adequately anticipate the number of eggs that will be needed to meet regional quotas. DWR management has acknowledged the problem; we have been told they are currently taking steps to adopt such a plan.

The challenge for Utah hatchery staff is to anticipate stocking needs at least three years in advance to determine how many brood stock to maintain.

Keeping More Brood Stock Than Needed Is Part of the Problem. As previously mentioned, nearly every fish stocked in Utah waters comes from one hatchery's adult brood stock that are maintained for egg production. Two other hatcheries house their own brood stock but the disproportionate majority is from Egan Hatchery. Most fish reach sexual maturity at three years and are most useful for captive egg collection from ages three to six. After that time, the fish are transferred to a community pond somewhere in the state. The goal of Egan Hatchery is to constantly replenish that brood stock so that there are always several groups of fish producing eggs for use in the state's hatcheries. The challenge for staff is to anticipate stocking needs at least three years in advance to determine how many brood stock to maintain. Our analysis concluded that, historically, the state has kept more brood stock than needed.

We found that some neighboring states provide useful models for how Utah could craft a better planning process. For example, the Wyoming Game and Fish Department (WGFD) uses a database to plan egg and fish needs two years in advance. Wyoming biologists enter their requests in January and fish needs are designated either priority A or priority B. Priority A requests include all fish needs that are considered biologically necessary to maintain the fishery and are stocked first. Priority B requests include all fish that are not biologically necessary, but are still wanted by biologists to improve the quality of fishing. The WGFD central office processes the information and then makes it available to all of its hatcheries. The hatcheries then review the information and respond to the central office with the quantity of fish they can produce.

As a result of this planning, Wyoming reports that they usually discard less than 10 percent of their eggs. The majority of discarded eggs are actually green eggs that come from wild traps and are discarded at the time of spawning. Discarded eyed eggs are rare.

The Arizona Game and Fish Department (AZGFD) and the Colorado Division of Wildlife (CDOW) also use a database system to plan future egg and fish needs. Colorado has been using an electronic database for several years. All biologists, hatchery managers, and supervisors have access to the database. Biologists make fish requests through the system and hatchery managers provide capacity estimates. Management uses the information provided by the biologists and the hatcheries to make the most cost-efficient assignments.

The Arizona Game and Fish Department uses a similar database that relies on input from hatchery managers, biologists, and the central office. The database is used to allocate fish adequately throughout the state. Arizona rarely produces excess fish, as they purchase or are given all of their eggs and do not raise any brood stock.

We believe that the Utah Division of Wildlife Resources can better anticipate their fish needs by modernizing their planning process as other states have done. DWR should work towards reducing waste throughout the process and gaining economies of scale through production when possible. To accomplish this, additional oversight by DWR management will be needed.

Oversight from DWR Management Is Needed. We reviewed the various oversight mechanisms in place at DWR and concluded that increased oversight from division management is likely the best approach to achieving a more cost-efficient hatchery operation through improved planning. The patterns of waste we identified have apparently gone unchecked for some time. We discussed these issues with DWR management and found it was unclear what direction the Aquatics Section had been given for managing their program in a way that reduces cost.

One comment we heard frequently throughout the audit was that the fishing in Utah is some of the best in the region. While this may indeed be the case, we believe that high quality fishing does not need to come at the expense of an inefficient hatchery production process.

Wyoming, Arizona and Colorado all use a database to plan future fish and egg quotas.

DWR can better anticipate their fish needs by modernizing their planning process as other states have done.

Utah's high quality fishing does not need to come at the expense of an inefficient hatchery production process.

It is not our intent to undermine the achievements DWR has made in making Utah's waters attractive to anglers. It is our intent, however, to recommend that DWR improve the efficiency of its fish hatchery operations. In our opinion, a quality fishery and a cost-efficient hatchery system are not mutually exclusive.

DWR management needs to work to produce fish in the most cost-efficient way possible while continuing to preserve the quality of sport fishing in the state. We are encouraged by DWR's preliminary actions and acknowledgment of the audit's recommendations as effective strategies to improve the hatchery process.

Recommendations

1. We recommend that DWR better track the costs of fish egg production.
2. We recommend that DWR develop a three to five year plan to limit the number of excess fish and excess fish eggs produced.

Chapter IV Conservation Permits and Cooperative Wildlife Management Units Appear Beneficial

We were asked by the Legislature to determine if the Division of Wildlife Resources' (DWR) practice of allocating limited-entry hunting permits, to be auctioned by conservation groups, diminishes the opportunity for Utah families to draw a permit to participate in the hunt for big game species in the state. We were also asked to determine if the division re-invested the proceeds from permit sales in conservation efforts, as required by law.

Limited tests of this area revealed not only that public opportunities were not significantly diminished by the issuance of conservation permits, but also that the money raised through the program appears to promote species conservation and habitat preservation. We also reviewed Utah's Cooperative Wildlife Management Unit (CWMU) program and found that the program provides public hunting opportunities on private land while giving landowners incentives to conserve valuable wildlife habitat.

Conservation Permits Have Little Impact On Public Hunting Opportunities

Conservation permits do not significantly diminish public probability of drawing a hunting permit and appear to provide a benefit to the public by promoting habitat preservation and species conservation. We compared the probability of a public hunter drawing a limited-entry hunting area permit with and without conservation permits being issued. While the probability of drawing a permit decreased slightly, the diminished impact to the public was negligible. Figure 4.1 shows the probability prior to and after conservation permits were issued for buck mule deer and bull elk in 10 limited-entry hunting areas across the state.

Conservation permits do not significantly diminish the public's probability of drawing a hunting permit.

Figure 4.1 Public Probability of Drawing a Buck Deer or Bull Elk Permit When Conservation Permits Are and Are Not Included. The probability of drawing a hunting permit does not significantly diminish with the inclusion of conservation permits.

	Total Number of Permits	Conservation Permits Issued	Prob. of Drawing a Permit	Prob. Once Conservation Permits Are Withdrawn	Total Reduction In Prob. to Public
Buck Mule Deer					
Henry Mountains	62	2	0.59%	0.58%	0.02%
Book Cliffs	574	8	6.75%	6.65%	0.09%
Paunsaugunt	202	8	3.72%	3.57%	0.15%
West Vernon	199	8	5.96%	5.72%	0.24%
South Slope Diamond	72	6	6.04%	5.53%	0.50%
Bull Elk					
Wasatch	496	8	6.84%	6.73%	0.11%
Pahvant	110	6	2.77%	2.62%	0.15%
Kaiparowits	96	5	4.21%	3.99%	0.22%
Book Cliffs/Bitter Creek	146	7	5.28%	5.03%	0.25%
West Desert Deep Creeks	40	2	8.47%	8.05%	0.42%

In every example we looked at, conservation permits diminished the probability of the public drawing a permit by less than one percent.

As shown in Figure 4.1, allocating a small number of permits to conservation groups had an impact of less than one percent in every example. It should be noted that initial prospects of drawing a public limited-entry hunting permit are very poor to begin with, due to the relatively few permits available and the high demand for hunting in these coveted areas. For example, over 5,000 hunters applied for a permit on the Paunsaugunt, yet only 3.72 percent were successful. Despite the public’s low probability of drawing a permit on one of these areas, the public benefits through habitat preservation and species conservation efforts made possible by the sale of these permits by conservation groups.

Proceeds from Conservation Permit Sales Enhance Wildlife Habitat

The sale of big game permits for limited-entry hunting units by conservation groups has contributed to habitat preservation and species conservation efforts. At least 90 percent of the revenue generated from permit sales is used for conservation activities. On-site inspections indicated that this revenue was being used appropriately, for the limited locations that we were able to visit.

Appendix A details the total amount of revenue and number of permits sold by conservation organization over the last five years. Between 2006 and 2010, The Utah Conservation Permit Program generated \$14.2 million in revenue, selling 1,802 permits. When

The Conservation Permit Program generated \$14.2 million in revenue selling 1,802 permits.

compared with \$6.6 million in revenue for the 27,500 permits sold for all limited-entry permits over the same time period, the relative value of each permit is much greater for conservation permits. The average cost per conservation permit was \$7,880 whereas the average price per limited-entry permit was \$239, signaling the importance of the revenue generated from conservation permits. Revenue generated from these permits is distributed between DWR and the conservation organization as follows:

30 percent remitted to DWR

60 percent retained by organization for eligible projects

10 percent retained by organization for administration

Ninety percent of the revenues generated through conservation permit sales are used for habitat restoration and species conservation projects. All habitat restoration and species conservation projects are approved by the division director. These projects include:

- Habitat enhancement
- Species transplants
- Aerial surveys
- Radio telemetry studies
- Research projects

We visited a number of habitat improvement projects that were paid for with conservation funds to determine if the projects were benefitting wildlife, as required by law. These visits consisted of meeting with regional biologists and observing projects underway in the Paunsaugunt, Fillmore-Pahvant, and Zion/Pine Valley limited-entry hunting areas. The projects we visited were intended to benefit mule deer, desert bighorn, and elk and involved habitat improvement projects like pinyon/juniper removal, water guzzler installations, and post-fire reseeding efforts.

According to DWR, “Habitat improvement projects are essential to maintaining healthy herds and expanding populations where appropriate.” For deer and elk, habitat improvement projects are designed to enhance the health of the existing herds. For other large game species like bison, bighorn sheep, pronghorn, and mountain goats, revenue generated from the conservation permit program has

90 percent of conservation fund revenue is used for projects that benefit big game species.

For deer and elk, habitat improvements projects are designed to enhance the health of the heard. For other large game, they are designed to expand the size of the herd.

We believe the sale of conservation permits promotes habitat improvement on public lands with no expense to the taxpayer, while negligibly reducing the public's opportunity to draw a permit for a limited-entry hunting area.

increased populations through the use of species transplants and re-introductions. Overall, our limited visits verified that conservation funds are being used as intended.

In conclusion, the sale of conservation permits promotes habitat improvement on public lands with no expense to the taxpayer, while negligibly reducing the public's opportunity to draw a permit for a limited-entry hunting area. We would encourage the division to continue to support this program.

In addition to the conservation permit program, we also reviewed the state's Cooperative Wildlife Management Unit (CWMU) program and found that the program improves hunting opportunities and wildlife habitat on private land.

CWMUs Promote Hunting Opportunities And Wildlife Habitat

CWMUs enhance public hunting opportunities on private property and incentivize landowners to promote wildlife habitat. The primary purposes of the CWMU program are to:

- Increase wildlife resources
- Provide income to landowners by presenting them with an incentive to manage their lands in a way that protects, sustains and benefits wildlife and wildlife habitat
- Provide the general public with access to private lands for hunting within a CWMU

CWMUs are large tracts of contiguous private property where the owner or operator will select a ratio of private to public permits for hunting a particular species.

Our review of this program involved meeting with the division's CWMU program manager, visiting the state's largest CWMU, and reviewing an independently performed study specific to Utah's CWMU program.

CWMUs are large tracts of contiguous private property where the owner or operator will select a ratio of private to public permits for hunting a particular species. The public can then enter into a drawing for the public permits on that property while the CWMU operator can

sell or keep the permits DWR provides to them. Figure 4.2 shows the options a CWMU operator can choose from to distribute permits to the public.

Figure 4.2 CWMU Private-to-Public Permit Ratio Options. According to the administrative rules that govern the CWMU program, CWMU operators must choose from the following permit allocation options:

Elk & Deer	Antlered (Buck/Bull)		Antlerless (Doe/Cow)	
	CWMU Share	Public Share	CWMU Share	Public Share
Option 1	90%	10%	0%	100%
Option 2	85%	15%	25%	75%
Option 3	80%	20%	40%	60%
Option 4	75%	40%	50%	50%
Moose & Pronghorn				
Option 1	60%	40%	40%	60%

As shown in Figure 4.2, if a CWMU operator chooses option 1, the public would have access to 10 percent of the antlered permits on that CWMU property and all of the antlerless permits. CWMUs will select from these options depending on the operator’s particular management objectives. We were told by division management that the majority of the CWMU operators select option one.

In order to evaluate whether the public was receiving its share of the permits as required by law, we reviewed permits issued in 2011 on 10 of the state’s largest CWMUs. The distribution of private-to-public permit ratios is shown in Figure 4.3.

We were told that the majority of the CWMU operators select option one, giving the public 10 percent of the antlered permits and 100 percent of the antlerless permits.

Figure 4.3 Private to Public CWMU Permit Ratio for Big Game With and Without Antlers. The public received 15 percent of the total antlered hunting permits and 89 percent of the antlerless permits in 2011 at the 10 largest CWMUs.

CWMU	Antler Private		Antler Public		Antlerless Private		Antlerless Public	
	Permits	%	Permits	%	Permits	%	Permits	%
Deseret	163	0.77	49	0.23	37	0.12	283	0.88
Spring Creek	97	0.88	13	0.12	17	0.24	53	0.76
Ensign Ranches	62	0.87	9	0.13	1	0.01	101	0.99
Heaston East	35	0.90	4	0.10	10	0.25	30	0.75
Grass Valley	167	0.89	21	0.11	2	0.06	32	0.94
Grouse Creek	2	0.50	2	0.50	0	0.00	6	1.00
Alton	28	0.82	6	0.18	2	0.40	3	0.60
Weber Florence Creek	139	0.89	18	0.11	1	0.03	31	0.97
Two Bear	47	0.89	6	0.11	1	0.05	21	0.95
Skull Valley - South	11	0.85	2	0.15	0		0	
TOTAL	751	85%	130	15%	71	11%	560	89%

Note: Totals may not add due to rounding.

Our review determined that the public received 15 percent of the antlered permits and 89 percent of the antlerless permits, which is consistent with what is presently required by rule.

One concern, raised by our review, is that the distribution of permits may not be equitable to the public. Although CWMU land is private, the wildlife that inhabits these units is a public resource. Therefore, the distribution of all permits to the public must be as equitable as possible. The division should consider reviewing this program to ensure that the public receives a reasonable share of the antlered permits. We believe, however, that CWMUs provide a variety of other indirect benefits that enhance public hunting opportunities.

Public Hunting Opportunities Are Generally Enhanced by CWMUs

We found that public hunting opportunities on private lands appear to be enhanced as a result of the CWMU program. Specifically, CWMUs enhance public hunting access, reduce taxpayer costs associated with depredation on private land, and enhance wildlife by mitigating development pressures.

CWMUs Open Public Hunting on Private Land. The CWMU program has opened up more than two million acres of privately held land to public hunting. This is private land that was largely unavailable to public hunters prior to the program's start in 1992.

Our review determined that the distribution of antlered permits may not be equitable to the public and needs to be reviewed by DWR.

CWMUs enhance public hunting access, reduce taxpayer costs associated with depredation on private land, and enhance wildlife by mitigating development pressures.

Depredation Costs Are Reduced. Another public benefit of CWMUs is that they reduce taxpayer costs associated with depredation. When big game animals cause damage on agricultural property that is oriented to commercial gain, landowners are eligible to receive compensation from the state for the damage caused. Participation in a CWMU program limits this compensation.

CWMUs Enhance Wildlife Habitat. A 2011 Utah State University study concluded that the CWMU program has been effective at mitigating development pressures. According to the study, CWMU land parcels were split up less frequently than non-CWMU land parcels, indicating a benefit to the species that inhabit these lands. This is important, given the fact that while CWMUs account for only 18 percent of all privately held land, they contain 33 percent of elk habitat, 42 percent of moose habitat, and 26 percent of mule deer habitat in the state.

According to one program operator we spoke with, the CWMU program has promoted wildlife by “getting landowners to view wildlife as an asset rather than a liability.” This operator felt that the additional economic incentive provided by the CWMU program has not only enticed private landowners to participate in CWMUs but has also helped landowners make improvements to their land that directly benefit wildlife.

Recommendation

1. We recommend that DWR review the allocation of CWMU permits to ensure that the public receives an equitable share of antlered permits.

Although CWMUs account for only 18 percent of all privately held land, they contain 33 percent of elk habitat, 42 percent of moose habitat, and 26 percent of mule deer habitat in the state.

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Appendix

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APPENDIX A

Organization	Year
	2007
	2008
	2009
	2010
	2011
TOTAL	

Sportsman for Fish & Wildlife	
Amount	Permits
\$ 1,039,552	102
1,079,055	102
860,000	102
948,400	116
799,290	116
\$ 4,726,297	538

Mule Deer Foundation	
Amount	Permits
\$ 913,220	151
976,510	152
822,802	152
900,020	95
754,695	95
\$ 4,367,247	645

FNAWS	
Amount	Permits
\$ 405,870	24
382,650	24
390,075	24
502,090	43
486,785	43
\$ 2,167,470	158

Rocky Mountain Elk Foundation	
Amount	Permits
\$ 336,775	30
288,390	30
250,675	30
262,095	39
235,000	39
\$ 1,372,935	168

Organization	Year
	2007
	2008
	2009
	2010
	2011
TOTAL	

Safari Club International	
Amount	Permits
\$ 81,515	8
83,760	8
72,055	8
148,850	7
102,500	7
\$ 488,680	38

National Wild Turkey Federation	
Amount	Permits
\$ 82,670	37
89,425	37
66,365	37
68,085	32
65,470	32
\$ 372,015	175

Ducks Unlimited	
Amount	Permits
\$ 19,000	4
14,625	4
26,200	6
18,300	6
-	0
\$ 78,125	20

Utah Bowmen Association	
Amount	Permits
\$ 6,000	2
10,250	2
6,750	2
15,400	4
28,700	7
\$ 67,100	17

Year
2007
2008
2009
2010
2011
TOTAL

Revenue	Total Permits
\$ 2,884,602	358
2,924,665	359
2,494,922	361
2,863,240	342
2,472,440	339
\$ 13,639,869	1759

Source: Division of Wildlife Resources

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Agency Response

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GARY R. HERBERT
Governor

GREGORY S. BELL
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Wildlife Resources

JAMES F. KARPOWITZ
Division Director

November 3, 2011

John M. Schaff, CIA
Auditor General
PO Box 145315
Salt Lake City, Utah 84114

Dear Mr. Schaff,

We have received your draft audit report #2011-14, dated November 2011. After reviewing the draft, we have attached an official response for inclusion in your final report. Overall, we found the audit report very positive. The auditors were objective in analyzing our operations and in making recommendations to increase efficiency. We appreciated the professionalism and hard work of your staff throughout the audit.

The Utah Division of Wildlife Resources is primarily a self-funded agency. It is critical that we maintain maximum efficiency while still providing the recreational opportunities our customers expect. We want them to have great experiences in Utah and to continue purchasing licenses and permits each year. The audit will help ensure that we explore all efficiencies before seeking additional funds from hunters and anglers.

As you noted in your draft, we have already begun to implement some of the audit's recommendations. We plan to review and implement more of them in the upcoming year.

Thank you for giving us an opportunity to respond to this report. You are welcome to contact me at any time to discuss our response or the actions we have taken to improve efficiency.

Sincerely,

James F. Karpowitz, Director
Division of Wildlife Resources

CC: Mike Styler, Executive Director
Department of Natural Resources



Agency Response to Legislative Audit Report #2011-14, A Performance Audit of the Utah Division of Wildlife Resources

The following response from the Utah Division of Wildlife Resources (Division) addresses the summaries and recommendations in the audit report. For ease of use, the chapters and subsections listed below correspond to those in the report.

Chapter II

Hatchery Production Trends

The audit report noted that production costs and pounds of hatchery-grown fish have increased over the past five years. These increases had three main causes:

- **Hatcheries reopened.** A handful of once-closed hatcheries reopened after reconstruction work ended. The reopened hatcheries—including the Whiterocks and Midway facilities—increased the Division’s fish-production efforts.
- **Larger fish stocked.** The Division began stocking larger fish in key waters after Utah-specific research indicated that larger fish were much more likely to survive predators. In Strawberry Reservoir, for example, small stocked fish (less than eight inches long) were consumed in large numbers by the reservoir’s large, cutthroat trout. When the Division changed its management approach and began stocking larger fish, cutthroat predation declined substantially. This decline allowed a vast number of rainbow trout to reach catchable size.
- **Operational costs increased.** Skyrocketing operational costs (for electricity, propane and fish feed) have increased the overall cost of raising fish. For example, the Division’s average cost per pound of fish feed has jumped nearly 50 percent in the past five years.

Cost Data Tracking

The audit recommended that the Division should more closely track its fish-production costs. The Division does track costs by hatchery—as well as statewide costs—but has not historically tracked costs per species. Also, the Division does not track the costs incurred in performing certain activities, including feeding, egg handling and spawning. Based on recommendations in the audit, the Division may hire an analyst who can establish critical metrics and implement a tracking methodology to capture these costs. With the addition of an analyst, the Division should be able to assess all costs in the production cycle, determine the costs of various species and optimize costs within the hatchery system. The savings recouped by the analyses will more than pay for the cost of the new position.

Hatchery Efficiencies

The State of Utah owns and operates 12 major hatcheries to provide fish for anglers. On occasion, the Division also purchases some fish from private growers to supplement fisheries with a few species not grown in the hatcheries. As identified in the audit report’s Figure 2.2, the cost per pound varies among the hatcheries. The main reasons for cost differences are hatchery size/location, quantity of water, technologies utilized, the presence of brood fish and the species of fish grown at the hatchery. Clearly, some hatcheries—Mammoth Creek and Mantua, for example—are more expensive to operate. The Division plans to assess each of the high-cost hatcheries to determine if fishery needs can be met more cost effectively in other facilities. If so, production could be shifted to hatcheries with lower costs.

As highlighted in the audit report, some costs (such as transportation) are not factored into savings and may reduce the potential for total cost savings. The Division also needs to consider the risk of disease if fish are overconcentrated in a hatchery. Many diseases, including bacterial coldwater disease, thrive in crowded environments. Because Utah has many fish-production options and facilities, the Division has been able to routinely maintain statewide stocking quotas, even during times of hatchery closure.

Types of Fish Raised

The Division raises more than 10 varieties of fish in Utah hatcheries, and the audit report accurately explained that some types are more expensive to raise than others. Certain species of fish are sterilized to ensure that they cannot reproduce in the wild. (This prevents populations of hatchery-raised fish from breeding with native fish or other sportfish species.) The sterilization process increases the expense of raising those fish. The Division grows a variety of fish in order to:

- Satisfy angler interests
- Take advantage of desirable management attributes
- Ensure survival in certain water temperatures
- Accommodate waterbody differences (streams vs. lakes)
- Provide disease resistance
- Meet other unique needs (stocking community fisheries)

The Division realizes that some fish species may be adding costs without generating an equivalent return in increased license sales. An evaluation of these species will occur, as recommended by the auditor. Going forward, the Division will avoid using the more expensive sterilized fish to stock community fisheries, except in situations where this concern is superseded by higher transportation costs.

Chapter III

Waste in Egg Production

The audit report examines the significant overproduction of fish eggs at state hatcheries. The Division intentionally produces some extra fish eggs each year to compensate for losses due to infertility, sterilization, disease and other factors. To account for those losses, Division biologists believe that an optimum level of egg overproduction is about 20 percent. The Division agrees that in past years, it produced an excessive number of fish eggs. Many of those were given to federal hatcheries, the Ute tribe, hatcheries in other states and—in rare cases—to private hatcheries. It is important to note, however, that in some cases the eggs given away to hatcheries (such as the Jones Hole Federal Hatchery in eastern Utah) are actually grown and stocked back into Utah waters. The Division is working with the Ute tribe to produce fish for Utah anglers with eggs from Division hatcheries. Occasionally, Utah is the recipient of extra eggs produced in other states, as evidenced by a recent offer of kokanee eggs from Montana. As the auditors noted, it is difficult to assess the exact cost of fish eggs because the Division does not specifically track those costs. However, the production of excess eggs does increase costs. The Division plans to implement a more comprehensive activity-based system to allow better tracking of costs in egg production and other areas of hatchery management. Agency personnel are now developing a management plan to identify long-term fish needs and to establish future hatchery-production priorities. In addition to preparing the Division's one-year fish and egg needs plan, aquatic managers will develop a three-year production schedule that allows more specific planning for brood and egg development. This approach should limit excessive egg production and thereby reduce costs, as recommended in the audit.

More Fish are Grown than Quota

Each year, the Division's regional aquatic managers identify how many fish, and which species of fish, they need to stock in their regions. Their proposed numbers are then adjusted to a quota, which is based on the hatcheries' production capacities and statewide priorities. These quotas represent a baseline number of fish that should optimally be delivered. In some years, the Division hatcheries produce fish in excess of the quota, and those fish are later stocked in nearby waterbodies or in high-demand locations. In the past two years, the Division has exceeded the quota by an average of five percent (in pounds). The auditors recommended that the Division refine its planning process to ensure that optimum numbers of fish are grown to meet fishery and angler needs. The Division concurs with that recommendation and will require the new analyst to complete an annual analysis.

Enhanced Planning

The audit correctly identifies planning as a critical tool that will help the Division produce an optimum number of fish and fish eggs. Carrying excess brood stock requires feed and other resources that could be better used elsewhere. As the audit recommends, the Division has agreed to the development of a three-year production plan to ensure that the numbers of brood stock, fish eggs and fish meet anglers' needs without excess or waste. This plan should be completed within the next few months, and then the Division will implement it.

Chapter IV

Conservation Permits and Public Hunting Opportunity

The auditors thoroughly reviewed the Conservation Permit Program, examining the distribution process, program administration and on-the-ground outcomes. After analyzing how the program affected public hunting opportunities, the auditors observed that conservation permits diminish public opportunities by less than one percent. The Division concurs with this audit finding. Furthermore, the funds generated from conservation permit sales have been instrumental in reintroducing many game species to areas across the state. Without conservation permit funds, huntable herds of bighorn sheep, mountain goats, pronghorn and bison would not exist in many areas.

Proceeds from Conservation Permits Enhance Wildlife

The Division also uses the proceeds from conservation permit sales to fund watershed- and habitat-restoration projects throughout the state. The audit report summarizes it best, "...the sale of conservation permits promotes habitat improvement on public lands with no expense to the taxpayer, while negligibly reducing the public's opportunity to draw a permit for a limited-entry hunting area."

CWMUs Promote Hunting Opportunity and Wildlife Habitat

The Cooperative Wildlife Management Unit (CWMU) Program has been in existence since the early 1990s. It has successfully provided incentives for landowners to enhance wildlife habitat and to allow public access to their private lands. The audit observed that public hunting opportunities are generally enhanced by CWMUs, and taxpayer costs are reduced because of lower mitigation costs on private lands. The audit recommends that the Division review the allocation of CWMU permits to ensure that the public receives an equitable share. The Division acknowledges that private landowners receive a relatively high permit ratio. The Division establishes those ratios in administrative rule, and that rule is reviewed through a public process at least every five years. We will review the allocation ratios before the next rule renewal to ensure that circumstances do not warrant a change in the existing ratios.

Conclusions

The Division believes that this audit was both enlightening and fair. It identified areas where our agency needs to make improvements, yet it also acknowledged areas and programs that are working effectively. The Division has already taken steps to address the efficiency issues and long-term planning needs noted in the audit report. We appreciate the diligent and painstaking work of the audit staff during the span of this audit review.