

Arizona Game and Fish Department

State of Arizona Fish Hatcheries Report





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Executive Summary

Since 1922 the Arizona Game and Fish Department (Department) has operated 15 fish culture stations, six of which are still maintained and in operation today. Five of these fish hatcheries are used for cold water production and play a major role in providing good trout fishing in Arizona. The sixth hatchery is dedicated to warm water fish production. Warm water fish management in Arizona consists of both native fish and warm water sport fish. Every year, Department fish hatcheries contribute to the state economy by producing on average 385,000 pounds of fish and stock them into 118 locations throughout the state.

According to the analysis in the 2013 Economic Impact of Fishing in Arizona, annual recreational sport fishing produces \$1.47 billion in economic benefits for the state of Arizona. Among active anglers in 2013, the preference was: 69% fish for trout, 63% fish for bass and 30% fish for catfish. Current demand for sport fish in Arizona and the decreasing hatchery spring flows (water supply) have resulted in an annual shortfall of approximately 110,000 pounds of trout and 30,000 pounds of warm water sport fish. The warm water sport fish deficit amounts to 230,000 pounds when demand of the Community Fishing Program is included.

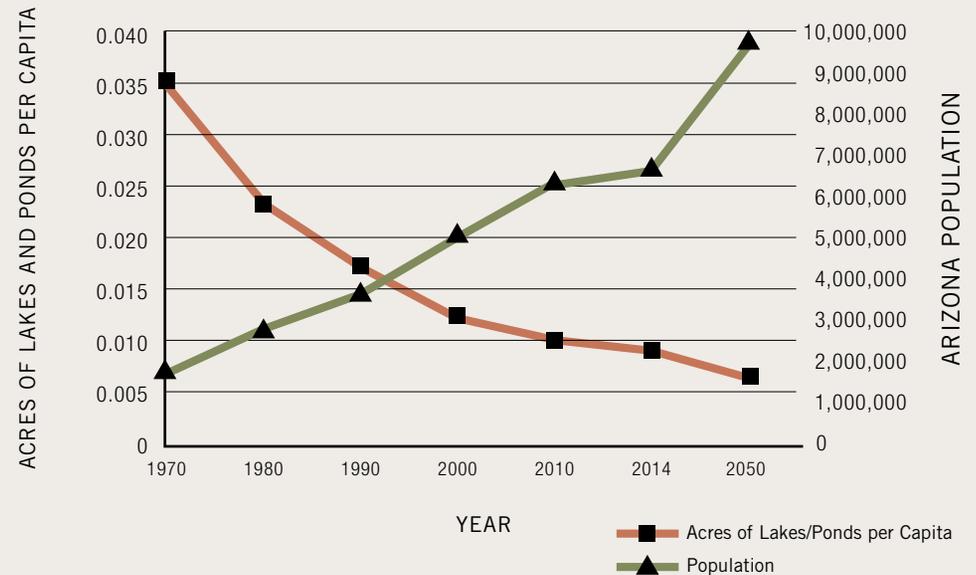
Hatcheries play a vital role in maintaining the quality of sport fishing in Arizona. Planning for the future is necessary to maintain and increase current production in order to meet current and future demand of sport fish in Arizona. In order to continue the current production of trout it is necessary to maintain the hatcheries' infrastructure. Renovation on many hatcheries is needed to ensure the Department's ability to meet the current demand for fish and eliminate the production shortfall. The fish hatcheries were renovated approximately 25 years ago with an anticipated lifespan of 20 years. Three possible approaches were identified for the future of the hatchery program: 1) Maintain Status Quo, 2) Perform Hatcheries Maintenance or 3) Perform Hatcheries Renovation and Expansions. We identified a required 3% increase annually on the hatchery operational budget to compensate for inflation and to minimize the effects on price increase for operational hatchery supplies. This hatchery maintenance approach would invest approximately \$6.7 million over six years on identified major facility maintenance needs. The renovation and expansion approach was identified as the best scenario based on the return on investment. The continuous decline in Sport fish Restoration Funds was made difficult planning the needs of the hatcheries for the future. The renovations and expansion will increase hatchery production between 25% and 30%, and will secured production of sport fish for the next 25 years. The investment to needed to implement all renovations and expansion options exceeds \$111 million dollars.



Introduction

The Arizona Game and Fish Department (Department) operates five cold water facilities for trout production and one warm water facility dedicated, at this time, primarily to native fish production. The fish hatcheries are destination facilities for bird watchers and the general public. Thousands of tourists annually visit the hatcheries and learn about the fisheries program and the Department's mission. Every year, Department fish hatcheries contribute to the state economy by producing on average 385,000 pounds of fish and stock them into 118 locations throughout the state. Among active anglers, the preference is 69% fish for trout, 63% fish for bass and 30% for catfish. Recreational sport fishing produces \$1.47 billion in economic benefits annually to the state of Arizona. According to the 2013 Economic Impact of Fishing in Arizona approximately 36% of the fishing economic benefits can be attributed to hatcheries. There are more than 350,000 anglers that spend over \$950 million on equipment and trip-related expenditures annually in Arizona. Sport fishing also generates 20,038 full time and/or part time jobs.

INCREASE IN POPULATION AND DECREASE IN ACRES OF WATER PER CAPITA



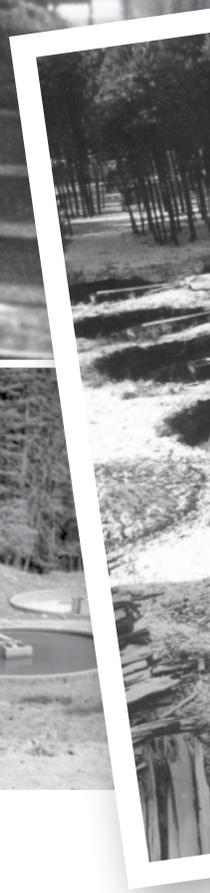
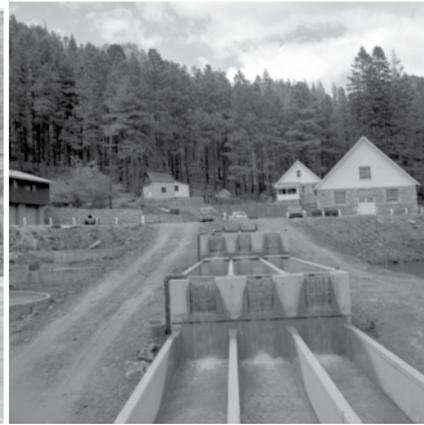
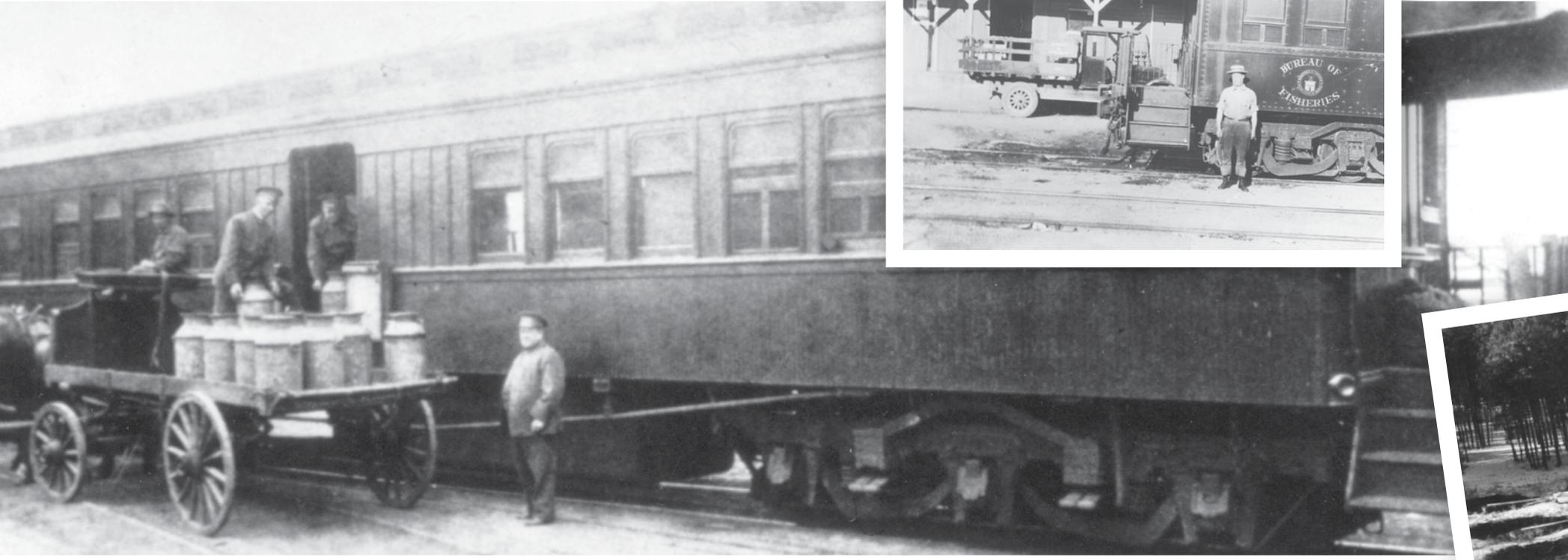


Arizona's population growth causes a continuous decline in the number of acres of lakes and ponds available per capita. This has created more fishing demand for Arizona lakes and ponds. Arizona's population of 6.39 million habitants in 2010 grew to 6.73 million in 2014 with a calculated 1.3% Compound Annual Growth (CAGR) (U.S. Census Bureau). The projected Arizona population in 2050 is estimated to be 9.7 million.

The Department fish hatcheries are aging and are in need of renovations and updates. The current increase in the demand of sport fish in Arizona and the decrease in the hatchery spring flows (water supply) make an annual shortfall of approximately 110,000 pounds of trout and 230,000 pounds of warm water sport fish based on regional and community fishing program annual fish request. In order to continue with the current production of trout it is necessary to increase maintenance of the hatcheries' infrastructure. Renovation on some hatcheries will allow the department to meet the current demand for fish and eliminate production shortfalls. The fish hatcheries were renovated 25 years ago and these renovations were predicted to last 20 years.

The Sport Fish Restoration Funds (the Dingell-Johnson Sport Fish Restoration Act (DJ), passed in 1950), which provides the main funding for the hatcheries program has been declining for several years, from \$8.3 million in 2008 to \$6.4 million in 2014; this declining in recent years has made planning difficult for the hatcheries.





Background

In the 1800's and early 1900's native Apache and Gila trout provided abundant fishing for the early settlers of the state. By the turn of the century, Arizona's population was growing rapidly, and it was believed that demand was exceeding the natural supply of trout in some streams.

Fish culture technology was under development during the 1800's and by the early 1900's the U.S. Bureau of Fisheries, (now the U.S. Fish and Wildlife Service) began cultivating and distributing various trout species throughout the country to meet angler increased demand. During this era, Arizona acquired rainbow, cutthroat and brook trout from the U.S. Bureau of Fisheries, which arrived by railroad car at various locations throughout the state.

Originally warm water fisheries were found throughout the state and consisted mostly of squawfish, Gila sucker, razorback sucker, roundtail chub, bonytail chub, and a variety of dace, suckers, topminnows and pupfish. In 1878 catfish were the first warm water fish stocked into Arizona. The European carp were stocked in 1880 and closely followed by Buffalo fish and other warm water species, such as Largemouth bass in 1896.

Since 1922 the Arizona Game and Fish Department has operated 15 fish culture stations, six of which are still in operation. Today, five of these hatcheries are of major importance in providing trout to Arizona anglers. Trout culture techniques have gradually evolved and refined into intensive raceway culture producing more numbers of fish in less space. A single state hatchery is dedicated to warm water fish production for Arizona. Warm water fish management in Arizona consists of native and non-native sport fish. Native fish management is directed towards the re-establishment of razorback suckers, roundtail chub, and Gila topminnow. The hatchery also produces native leopard frogs along with limited largemouth bass, and, bluegill.



The Value and Goal of Arizona Fish Hatcheries

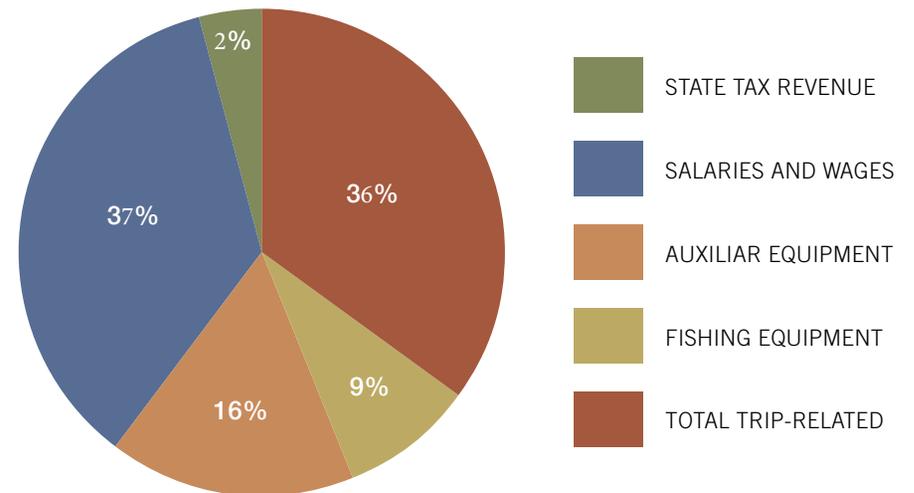
Almost all of the trout harvested in Arizona are stocked from our hatcheries, and there is only a single warm water facility in the state. The supply of trout, native and warm water sport fish are dependent on the ability of the hatcheries to produce the increased demand. Our hatcheries are aging, and in some cases antiquated and in disrepair, all are in need of renovations or improvements.

The hatcheries economic contribution to the state in 2013 was over \$412 million. The entire hatchery budget is \$2.6 million which represents a return on investment of over \$158.00 to the Arizona economy for each dollar spent on the hatcheries.

Our goal for Arizona Fish Hatcheries is to meet angler and conservation demand through the production and stocking of fish by 2026. To achieve this goal we identified three core objectives.

1. To increase our cold water program to 500,000 lbs. of trout produced and stocked in Arizona waters.
2. To increase our warm water program to 230,000 lbs. of warm water sportfish produced and stocked in Arizona.
3. To meet the conservation production and stocking needs for Arizona's endemic aquatic species.

TOTAL ECONOMIC IMPACT OF SPORT FISHERIES IN ARIZONA
\$1.47 BILLON



Hatcheries Budget FY'15				
Hatchery	Employer Salaries and Benefits	Operations	Maintenance	Others
Bubbling Ponds Hatchery	\$52,745.00	\$20,374.00		\$1,000.00
BPH Native Fish	89,100.00	187,490.00	1,363.39	1,000.00
Canyon Creek Hatchery	261,832.00	126,735.00		4,300.00
Page Springs Hatchery	532,980.00	265,923.00		12,200.00
Silver Creek Hatchery	140,613.00	49,913.00		1,300.00
Sterling Springs Hatchery	89,057.00	31,400.00	12,000.00	200.00
Tonto Creek Hatchery	270,590.00	140,789.00		2,000.00
Administration/ Coordination	104,317.00	37,040.00		800.00
Fish Health Laboratory	87,384.00	13,040.00		1,100.00
Maintenance	53,158.00		25,000.00	1,400.00
Total	\$1,681,776.00	\$898,244.00	\$38,363.39	\$25,300.00
Grand Total	\$2,643,683.39			



Fish Stocked in Arizona

Historically, there were numerous species of fish stocked in Arizona waters, the primary species of fish that are currently being stocked are:

- **Cold water:** Brown, Brook, Cutthroat, Rainbow, Apache and Gila trout and Arctic Grayling
- **Warm water:** roundtail chub, Colorado River pikeminnow, razorback sucker, Gila topminnow and Chiricahua leopard frog.
- **Future:** largemouth bass, tiger trout and bluegill

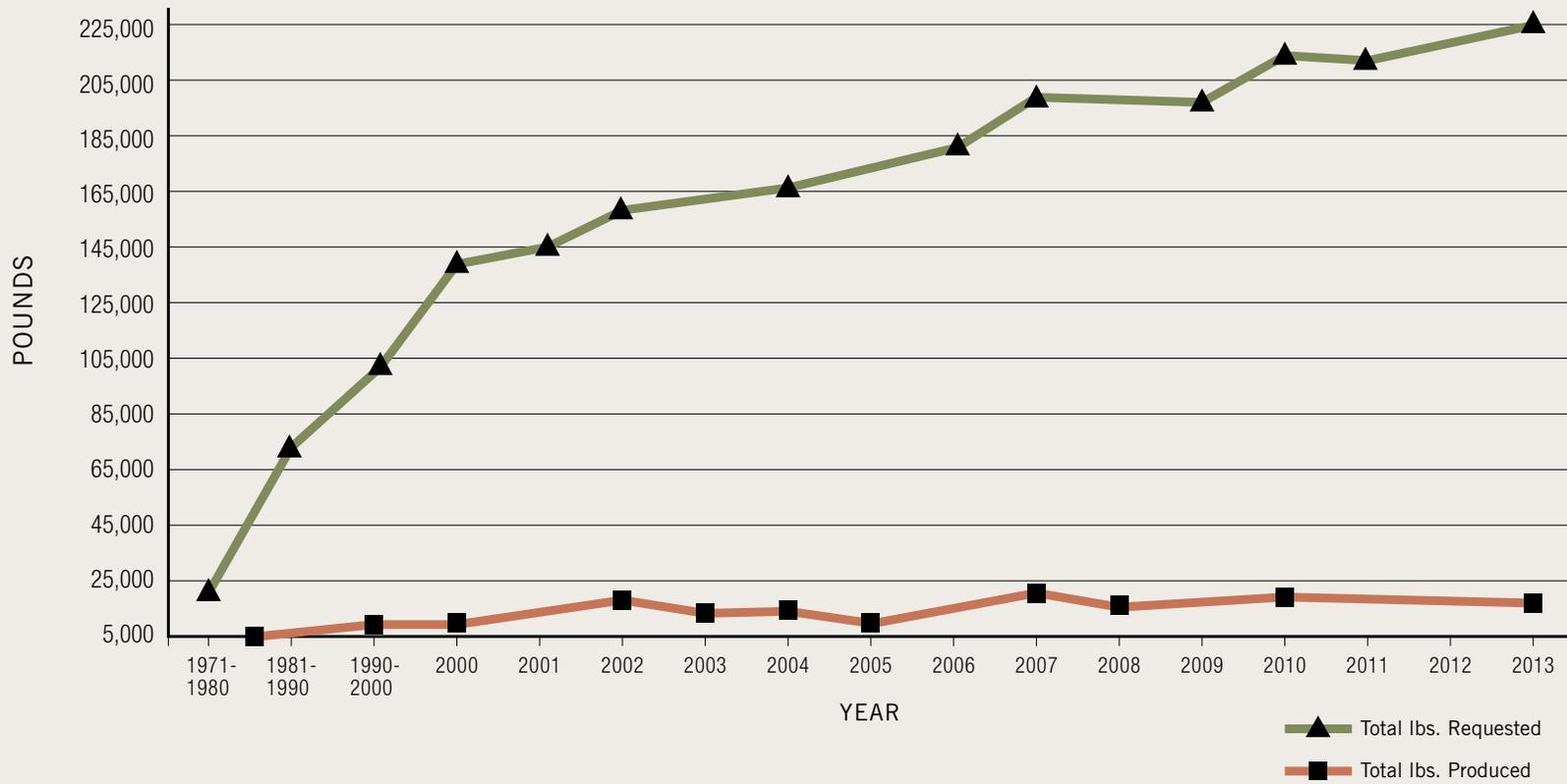
Annually, fisheries staff request trout for each stocking locations throughout the state. These requests are developed based upon the biological and public demand. The hatcheries were renovated in the late 1980's and early 1990's with the objective to meet future demand for sport fish in Arizona. Arizona fish hatcheries raise on average 385,000 lbs. of cold water sportfish. The current shortfall between pounds of trout requested and trout stocked is approximately 110,000 pounds; including the trout requested by the Community Fishing Program.

The difference between the demand and production of warm water fish is a deficit of 40,000 pounds. This deficit is increased to 230,000 pounds when the fish destined for the Community Fishing Program are included. The primary contributors to the shortfall between fish requests and fish production are the increase in demand, the decrease in spring flows due to drought, the aging facilities and compliance with waste water discharge standards. Every year, the warm water fish hatchery produces approximately 20,000 pounds of native fish contributing to the preservation of listed species in Arizona.





LBS. OF WARMWATER FISH REQUESTED VS. PRODUCED





Hatcheries Infrastructure

There are a total of six hatcheries owned and operated by the state of Arizona. Five of these hatcheries are dedicated to cold water production: Canyon Creek Hatchery (CCH), Page Springs Hatchery (PSH), Sterling Springs Hatchery (SSH), Silver Creek Hatchery (SCH), and Tonto Creek Hatchery (TCH). The warm water facility is Bubbling Ponds Hatchery (BPH) which is primarily dedicated to native fish and produces approximately 15,000 pounds for the preservation of our natural heritage. The hatcheries are aging and their infrastructure is too. The hatcheries major infrastructure consists of:

- 21 Residential homes
- 8 Detached garages
- 3 Visitor centers
- 4 Rearing buildings
- 7 Offices
- 3 Garage shops
- 4 Bunkhouses
- 4 Facilities with public restrooms
- 1 Fish health laboratory



PRODUCTION GOAL VS. APPROACH



Hatcheries Strategy Approaches

There are three possible approaches identified for the hatchery future: *Maintain Status Quo*, *Perform Hatcheries Maintenance* or *Perform Hatcheries Renovation and Expansions*

Maintain Status Quo

Trout angling in the state is maintained primarily by the hatchery program. Rising costs of fish feed, propane, gasoline prices, etc... has left the hatchery program conducting out of cycle budget requests and reallocations of capital purchases just to balance the budget at the end of the fiscal years. These reallocations have left the program with almost every vehicle in need of replacement within a few fiscal cycles. In addition, numerous major maintenance projects were delayed due to lack of budgets. To date the lack of adequate hatchery budgets has yet to be fixed. With this approach, the budget requirement would be adjusted every year by 3% in order to cover an increase in price for different hatchery supplies due to inflation. This approach would not cover the needed funding to complete major maintenance.

Perform Hatcheries Maintenance

Due to the current condition of the hatcheries infrastructure, the reduction of spring water flows and compliance to waste water discharge standards, fish production is limited. The estimated value of all hatcheries' infrastructure and equipment is several millions dollars. The limited amount of the overall hatchery program budget has restricted facility maintenance to approximately \$38,000 (1.4% of the overall budget). Due to this chronic budget shortfall major maintenance projects have been delayed. The trout fisheries in the state will be diminished and the economic loss for the state is estimated at over \$412 million a year. The warm water sport fish and the native fish program will also be negatively affected. These factors will have serious effects on the department's reputation, and make it will difficult to promote sport fishing and conservation of native species for the present and future generations.

Increased hatchery maintenance will secure the current production, but in some cases like Canyon Creek the production could be affected by complications with the old pipeline for water supply. This approach proposal would invest approximately \$6.7 million over six years on identified major facility maintenance needs. Also, the annual maintenance budget should be increased to \$250,000 dollars to secure current production for the next 15 years, through 2031. The time for maintenance varies between two and four years depending on the facility.

HATCHERIES MAINTENANCE TIME FRAME

	2017	2018	2019	2020	2021	2022	2023
DESIGN/PLANNING							
SSH	█						
SCH					█		
BPH	█						
CCH			█				
TCH				█			
PSH		█					
NEPA/EAC/SUP							
SSH	█	█					
SCH						█	
BPH	█	█					
CCH			█	█			
TCH				█	█		
PSH		█	█				
MAINTENANCE							
SSH			█				
SCH							█
BPH			█				
CCH					█		
TCH						█	
PSH			PSH B1	PSH B2	PSH B3		

Production Approach 1: Maintaining Status Quo of Operations

Sterling Springs Hatchery	1,300,000	Trout Fingerlings
Silver Creek Hatchery	20,000	lbs. trout
Bubbling Ponds Hatchery	15,000	lbs. native
Tonto Creek Hatchery	50,000	lbs. trout
Canyon Creek Hatchery	80,000	lbs. trout
Page Springs Hatchery	220,000	lbs. trout
Total	385,000	1.3 Million trout fingerlings

Production Approach 2: Operations and Major Maintenance

Sterling Springs Hatchery	1,300,000	Trout Fingerlings
Silver Creek Hatchery	20,000	lbs. trout
Bubbling Ponds Hatchery	15,000	lbs. native fish and 300,000 LMB fingerlings
Tonto Creek Hatchery	50,000	lbs. trout
Canyon Creek Hatchery	80,000	lbs. trout
Page Springs Hatchery	220,000	lbs. trout
Total	385,000	lbs. plus 300,000 LMB fingerlings
		1.3 Million trout fingerlings

Production Approach 3: Renovation and Expansion

Sterling Springs Hatchery	1,500,000	Trout Fingerlings
Silver Creek Hatchery	80,000	lbs. trout
Bubbling Ponds Hatchery	700,000	LMB fingerlings
Tonto Creek Hatchery	55,000	lbs. trout
Canyon Creek Hatchery	95,000	lbs. trout
Page Springs Hatchery	230,000	lbs. trout
** New Acquired Land adjacent to BPH	20,000	lbs. of native fish
** New Coldwater Hatchery	55,000	lbs. trout
** New Warmwater Hatchery	80,000	lbs. of Bluegill and 3,000,000 LMB fingerlings
	615,000	lbs. plus 3,700,000 LMB fingerlings and 1.5 Million trout fingerlings

**Including New property adjacent to BPH, New Coldwater and New Warmwater facilities

Perform Hatcheries Renovation and Expansion

The recommended approach is renovation and expansion. By doing this Department can maintain and in some cases improve production and reduce fish cost. Currently the hatcheries do not meet the demand of fish requested by the regions and the Department spends significant amounts of money purchasing sport fish to cover the continual growth of the Community Fishing Program. At this moment the gap between production and demand is over 110,000 pounds of trout alone. Without renovations, programs that are dependent on hatchery production will suffer. Implementing the facility renovations will not only improve production but also fishing opportunities.

Items that are in need of renovation include water supply collection systems, water delivery systems, water drainage pipelines, aeration columns, liquid oxygen systems, water flow measuring devices, water filtration, raceways replacements and/or resurfacing, warm water earthen ponds design and construction, replace pond liners and catch kettles on earthen ponds, fish culture buildings, workshops, storage areas, visitor centers construction and renovation, parking lots and asphalt resurfaces, road grading, disinfection station, wastewater treatment, fencing against predators.

Renovation will ensure fish production for the next 25 years, through 2041. The hatcheries will cover the current and future demand of fish needed for the state of Arizona including the trout demand for the Community Fishing Program. Trout production will be increased between 25-30 percent. There will be also be an increase in production of warm water sport fish, increase angler satisfaction and create new fishing opportunities in Arizona. The native fish program will also improve by increasing production in number of fish and number of species cultured. This approach requires the investment of approximately \$111 million divided in two phases: phase one require \$49.4 million over a period of 10 years and also increases the annual hatchery maintenance budget to \$300,000 in order to keep up with hatcheries' infrastructure. Under the phase one, the hatchery program would construct two new facilities: one at Silver Creek Hatchery and the other at the new property acquired adjacent to Bubbling Ponds Hatchery. Also, the external raceways at Sterling Springs would be completely redesigned and enclosed. The time for renovation varies three to five years depending on the facility. Phase two requires \$61.9 million over a period of 8 years. Under phase two, the hatchery program will acquire a new property to develop a cold water facility to expand the trout production, and a property to develop a new warm water facility.







Coldwater Fish Hatcheries

Sterling Springs Fish Hatchery (SSH)

Sterling Springs Hatchery is comprised of 2 acres at the headwaters of Oak Creek located approximately midway between Sedona and Flagstaff on Hwy 89A (Game Management Unit 6B). The property is owned by U.S. Forest Service (Coconino Forest), and operated by the Department's Hatchery Program under Special Use Permit (SUP) since 1955. The property includes recognized water rights of 392,000 gallons per day (272.2 gallons per minute) annually for non-consumptive use.

The primary purpose of SSH is to supply Page Springs Hatchery (PSH) with fingerling trout for growth out and stocking. Approximately 1.3 million fingerlings are raised from eggs at SSH for this purpose, although some are stocked directly into select waters as fingerlings. Due to the fact that the water at PSH is too warm to hatch trout eggs all the trout that are stocked from PSH were hatched at SSH this makes SSH hatchery vital for sport fishing in Arizona.



The US Forest Service has a recognized water right to the same spring source for domestic use at Pine Flats Campground and the Manresa housing subdivision. Decreased spring output compounds is a problem, and it will continue to be a challenge as drought persists and, human development expands.

Sterling Springs Hatchery has a single residence with separate garage and bunk house, a hatchery building, a storage shed, and several outdoor concrete raceways. The property is staffed by one full-time employee that reside on site, and one part-time employee, and are responsible for day-to-day operation and maintenance of the site.





SSH Facility Maintenance and Renovation			
Maintenance		Renovation	
Facility Archaeological Survey	\$ 20,000	Facility Archaeological Survey	\$ 20,000
Replace water pipes and bypass valves at parking lot	90,000	Design and build new hatchery	3,000,000
Resurface raceways	200,000		
Build a fence and roof over raceways	350,000		
Total	\$ 660,000	Total	\$3,020,000

The multiple-use raceway system that is in place today was constructed in the 1970's.

By maintaining the status quo eventually the water supply pipeline will have a catastrophic failure and the facility will be dewatered and a year's production will be lost. This would have up to 60% effect on state's trout production, and be devastating to trout angling. The maintenance approach will replace the damaged pipe, resurface the raceways and enclose the raceways. This approach will allow the facility to continue with the actual production numbers and secure them for the next 10-15 years. The estimated cost for facility maintenance is around \$660,000.

Sterling springs renovations would include the construction of a new hatchery building. Also, the epoxy coating of the outside

raceways is in need of repair. Currently the hatchery is out of commission due to the Slide Fire during the summer of 2014. This is an excellent opportunity to renovate the facility's old structures, parking lot and piping. Finally, improvements need to be made that would increase the dissolved oxygen in the raceways.



By renovating the facility, the external raceways will be redesigned to maximize the production and improve water quantity for fish culture. The facility would be redesigned to improve biosecurity and employee safety and renovation cost is estimated to be around \$3,020,000.

Silver Creek Fish Hatchery (SCH)

Silver Creek Fish Hatchery resides on commission owned land acquired in 1978. SCH is located approximately 11 miles northeast of Show Low in Navajo County (Game Management Unit 3B). The property is managed by the Fisheries Branch, Hatchery Program. The property is comprised of approximately 821 acres of deeded land at the headwaters of Silver Creek (Silver Spring), and along Silver Creek as it flows northwest towards White Mountain Reservoir. The property includes a recognized water right of 2,244 acre feet annually (3.1 cfs) for “in stream fish hatcheries”.

Many wildlife species utilize the property, either seasonally or year round. Common game species include elk, mule deer, antelope, and rabbits; waterfowl game species include mallards, teal, gadwall, and wigeons, as well as a variety of nongame birds including but not limited to herons, hawks, eagles, and cormorants. In addition, Silver Creek provides aquatic habitat for native fish species including speckled dace and bluehead sucker, as well as angling opportunities for Apache and rainbow trout.

There are currently two employee residences with separate storage units, a modular office building, a stable/barn, a public toilet, and storage shed near the spring. The residential and office buildings on the property were constructed in the 1990’s and are in good condition.

Silver Creek Hatchery is vital to sustain stocking of trout in the White Mountains. The property is staffed by two full-time Hatchery employees who reside on site and are responsible for day-to-day operation and maintenance of the site. The property has gained popularity with anglers, and supports a split trout season to accommodate catch-and-release anglers as well as those that prefer to harvest and keep their



catch. All the Apache trout stocked in Arizona are produced by Silver Creek Hatchery. The hatchery produces approximately 20,000 pounds of trout a year. This limitation in production is due to the rudimentary infrastructure, which consists of two sets of in ground raceways and no discharge permit.

The status quo approach would allow the facility to continue with its current production of 20,000 pounds of trout. Eventually the current in-ground raceways will continue degrading, which would affect the production of native Apache trout. The approach of increased facility



SCH Facility Maintenance and Renovation			
Maintenance		Renovation	
Facility Archaeological Survey	\$ 20,000	Facility Archaeological Survey	\$ 20,000
Water flow meters	40,000	Water rights cleared up for renovation	250,000
Shop and storage building	200,000	Design and build new hatchery 80,000 lbs.	10,000,000
Maintain raceway, bird netting, liner and cover	150,000	Build a Visitor Center	300,000
Handicapped fishing access	20,000		
Total	\$ 430,000	Total	\$ 10,570,000

maintenance would allow the hatchery program to continue producing the limited amount of Apache and rainbow trout on in-ground raceways for the next 10-15 years. The facility maintenance consists of installation of water flow meters, a new shop building, maintenance of raceways, bird netting and liner over. The estimated cost is approximately \$430,000.

The approach of facility renovation and expansion would allow production to increase up to 80,000 pounds of Apache trout for the next 25 years, significantly decreasing the current trout deficit of the state. The renovation would allow for redesigning the facility with aboveground raceways, reducing the risk of diseases, and maximizing production. This new facility would enhance the visitors' experience by the addition of a visitor center and improvement for the current facility fishing access. The estimated cost for facility renovation cost is estimated to be around \$10,570,000.



Canyon Creek Fish Hatchery (CCH)

Canyon Creek Fish Hatchery is located approximately 40 miles east of Payson in Gila County. The property is owned by U.S. Forest Service (Tonto Forest), and operated by the Department's Hatchery Program under Special Use Permit (SUP) since 1969. The property includes a recognized water right of 2,170 acre feet annually (3.0 cfs) for non-consumptive use, except for normal evaporated losses incurred in a flow-through system used in hatching and rearing fish.

A major renovation in 1992 converted the facility to its current use of 12 covered raceways and asphaltting of all surface roads. The infrastructure on the property includes 4 residences, a large hatchery shop/garage that also contains an office space and visitor center, a hatchery building with indoor tanks and a hydro-turbine to generate electricity for the facility, a feed storage shed, a public toilet, and several smaller structures for operational use. The property is staffed by four full-time Hatchery employees who reside on site and are responsible for day-to-day operations and maintenance of the site.

Canyon Creek Hatchery produces on average 80,000 lbs. of trout that represents 20% of the total trout stock in Arizona, generating an economic impact of \$125.9 million to the state; also CCH dedicates around 90% of its trout production to stock the White Mountains which represent 65% of all the trout stocked in the White Mountains.

The status quo approach would allow the facilities infrastructure to deteriorate and eventually have a serious effect on the White Mountains sport fisheries by decreasing the trout stock by 65%. Not only would this affect the state economy but also devastate the local economies as well. By selecting the maintenance approach, the facility would continue with its current production but risk the potential collapse of



the water supply pipeline. The estimated cost for the current facility maintenance is around \$2,830,000 which includes new electrical generation at low flow levels, repair raceways, sediment removal systems, renovation of visitor center, change of drain lines, repair bridge at Canyon creek, drill a well for domestic water, among other items.

The last major renovation performed to the facility was 23 years ago. During this renovation the water pipelines that transport the water from the spring to the hatchery were not replaced, and they are the originals (since the 1950's.) The decline of incoming water flow to the facility and the strict waste water discharge standards make it necessary to renovate the facility. The renovation would allow the implementation of modern technology which will allow a continuation of operations.



CCH Facility Maintenance and Renovation			
Maintenance		Renovation	
Facility Archeological Survey	\$ 20,000	Water supply lines from are from 1960's	\$ 8,000,000
Electricity generation at low flow levels	500,000	Primary effluent discharge treatment	2,000,000
Drill a new well for domestic water	300,000	Construction of more raceways	1,000,000
Water flow meters	40,000	Resurface the pavement	1,000,000
Repair raceways	100,000	Regarded houses area	40,000
Road bridge to Canyon creek	1,000,000		
Storage canopy building	200,000		
Sediment removal Systems	500,000		
Visitor center	25,000		
Houses roof	40,000		
Change drain line from the show pond	25,000		
Build a fence around fuel storage tanks	80,000		
Total	\$ 2,830,000	Total	\$ 12,040,000

A renovation could potentially increase up to 20% the current production at the facility. The facility renovation includes the replacement of water supply lines, construction of primary effluent discharge treatment, construction of a new set of raceways and resurface pavement. The approximate cost is \$ 12,040,000.



Tonto Creek Fish Hatchery (TCH)

Tonto Creek Fish Hatchery is located approximately 16 miles east of Payson in Gila County. The property is owned by U.S. Forest Service (Tonto Forest), and operated by the Department's Hatchery Program under Special Use Permit (SUP) since 1935. The Department obtained a Special Use Permit in 1936, and the facility was constructed in 1937 using a series of earthen ponds. A major renovation in 1993 converted the facility to its current use of 12 covered raceways and allowed for the asphaltting of all surface roads. The property includes a recognized water right of 420,478 gallons annually (4.55 cfs) for domestic use and non-consumptive use for wildlife, including fish. Long-term monthly monitoring of the spring sources indicates major fluctuations annually, but an overall decline for the past 30+ years.

The property includes 4 residences, a hatchery shop/garage, a large office building which contains a small visitor center as well as indoor tanks, and several smaller structures for operational use. The property is staffed by four full-time employees who reside on site and are responsible for day-to-day operations and maintenance of the site.

The average production of TCH is 50,000 lbs. of trout which represents 15% of all the trout stocked in Arizona, contributing to the economy of the state with approximately \$72.7 million annually.

Tonto Creek Hatchery has a visitor center and public restroom. Visitors can take a self-tour of the facility. The annual public visitation is estimated at 50,000-60,000 visitors annually who are informed and educated about the Department mission, hatcheries and the Fisheries Program.



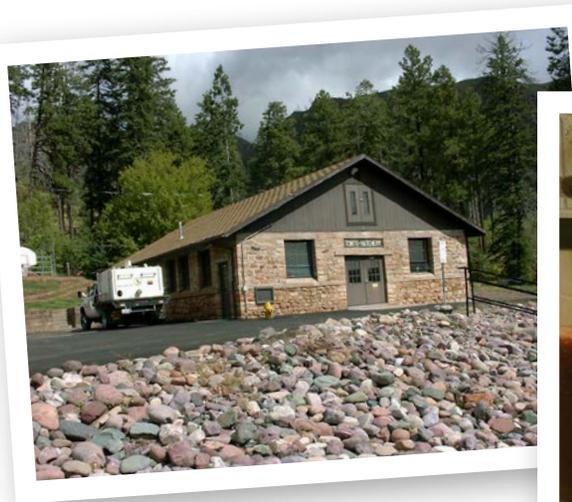
The status quo approach could have serious effects on trout production for the state. It could reduce the production of trout by approximately 50,000 pounds. The facility would continue deteriorating and waste water would continue to be a problem. Eventually the hatchery could be mandated to drastically reduce trout production. The worst case scenario would be the closure of the facility. The maintenance of the facility would continue with current production if the facility can maintain the water discharge standards. The maintenance consists of new septic systems, water aeration systems, surface water drain relocation, repair of indoor raceways, repair of roof at two houses,



TCH Facility Maintenance and Renovation			
Maintenance		Renovation	
Facility Archaeological Survey	\$ 20,000	Facility Archaeological Survey	\$ 20,000
Septic systems	300,000	Effluent treatment	1,500,000
Water flow meters	40,000	Replace water collection and piping	4,000,000
Water aeration systems	100,000	Replace fiberglass raceways	200,000
Surface water drain relocation	250,000	Resurface pavement	300,000
House replacement	300,000		
Repair fiberglass raceways	200,000		
Replacement of roof at two houses	30,000		
Visitor Center improvements	40,000		
Total	\$ 1,280,000	Total	\$ 6,020,000

visitor center improvements, water flow meters and a house replacement. The estimated cost for the current facility maintenance is around \$1,280,000.

The renovation of the facility would allow the maintenance of the current production and secure the production for the future by making a large investment on effluent treatment. The renovation cost is estimated to be around \$6,020,000 and consists of improvement on effluent treatment capabilities, replacement of water collection and piping, replacement of indoor raceways and resurface pavement.



Page Springs Fish Hatchery (PSH)

Page Springs Fish Hatchery resides on Commission-owned land approximately 4 miles northeast of Cornville, AZ. The property is managed by the Fisheries Branch, Hatchery Program, and is comprised of two separate parcels totaling approximately 190 acres. There are two springs on PSH that include the “Cave Spring” (also known as the Page Spring Tunnel) and the “Pond Spring Area.” The water from the Page Spring Tunnel has been historically shared with other claimants downstream along the Page Ditch. Subsequent disputes over ditch water from the 1980’s to 2000’s led to an Operating Agreement with Page Springs Ditch Users in February 2004, whereby the Department formally agreed to split the spring water equally with downstream users.

In 1990-91 the facility was renovated, making it a showcase facility with state of the art raceways and canopies, a visitor center, and a self-guided tour path. The Audubon Society identified habitat at the hatcheries and riparian area along lower Oak Creek as an Important Bird Area (IBA), and it draws thousands of wildlife watching enthusiasts.

The property has 4 employee residences, a studio bunkhouse, a large enclosed garage/shop, a large carport, numerous storage sheds and detached garages, a main office, a visitor center with restrooms, and separate areas of canopy-covered rearing units. The hatchery is staffed by nine full-time employees, all of whom are responsible for day-to-day operation and maintenance of the sites.

Page Springs Hatchery is the largest state run hatchery. It produces on average 216,000 lbs. of trout which equals approximately 57% of



the stock trout in Arizona, PSH makes a \$185.3 million positive impact to the overall state economy.

The status quo approach eventually would reduce the capability of the facility to produce trout. The infrastructure would continue degrading to the point that would affect the sport fisheries in the state. The maintenance approach consists of repair residences and storage buildings, replace valves, resurface concrete raceways, and replace fencing on gates. The approximate cost for this approach is \$530,000 and would allow the facility to continue with its current production for the next 10-15 years.



PSH Facility Maintenance and Renovation			
Maintenance		Renovation	
Facility Archaeological Survey	\$ 20,000	Facility Archaeological Survey	\$ 20,000
Residence and storage buildings	120,000	Fence the Show Pond	30,000
Hatchery Signage	35,000	Install Canopies Over Show Pond	20,000
Resurface Concrete Raceways	200,000	Plan a Design a Hatchery Renovation	1,000,000
Rebuild risers/LHO Boxes	12,000	Restore Spring Collection Devices, all water pipes, raceways and water treatment Features	4,000,000
Replace valves	8,000	NEPA Cost Associated with Renovation	150,000
Replace Raceway canopy	85,000		
Restore ET beds	5,000		
Replace Fencing On Gates	20,000		
Replace and Install New Flow Meters	25,000		
Total	530,000	Total	\$ 5,220,000

The renovation of the facility would secure and maximize production for the next 25 years. The facility would expand their customer service, increasing customer satisfaction by creating a pond dedicated to fishing clinics. The renovation cost is approximately \$5,220,000 and consists of resurface raceways, restore spring collection devices, replacement of water pipes, add new water treatment features and enhance outreach and customer service experience.





Warm Water Fish Hatchery

Bubbling Ponds Fish Hatchery (BPH)

Bubbling Ponds Fish Hatchery resides on Commission-owned land approximately 4 miles northeast of Cornville, AZ. The property is managed by the Fisheries Branch, Hatchery Program, and is comprised of two separate properties, Page Springs Hatchery (PSH) and Bubbling Ponds Hatchery (BPH) totaling approximately 190 acres. The BPH property includes two separate certified water rights. One large spring on the separate 12.5 acre parcel feeds Bubbling Ponds Hatchery (Page Spring #2, or also known as Bubbling Ponds Spring) with 11 cfs or 7,963 acre feet for the operation of a fish culture station. Another spring (Page Spring 2A, also known as the Bass House Spring) has a recognized right of 724 acre feet annually for non-consumptive use for the purpose of wildlife, including fish (fish hatchery).

This facility originally produced trout until 1980 when trout production was moved entirely to Page Springs Hatchery. Catfish production dominated for several years but was then phased into production of sunfish and, bass. In addition several species of native fishes were cultivated. In the mid-1990's, the hatchery began raising razorback suckers under contract for the Bureau of Reclamation. Since this time the primary production at Bubbling Ponds Hatchery has consisted of razorback suckers and a few other native species as well as a limited number of warm water sport fish. Currently the hatchery holds two agreements for the production of native fish. One contract is with the Salt River Project (SRP) and the other with the U.S. Bureau of Reclamation (USBR). These two agreements funds BPH with approximately \$250,000 annually. The property provides habitat for rare or declining species such as northern Mexican garter snake, Page spring snail, and a rare species of caddis fly. The Audubon Society identified



the habitat at the hatcheries and the riparian area along lower Oak Creek as an Important Bird Area (IBA), which draws thousands of wildlife watching enthusiasts.

The property has been operated by the Department primarily as an aquaculture facility since the acquisition in 1954 (105 acre parcel). Since then, pond aquaculture has changed very little, and small improvements have been made to the facility over time. Most of the ponds were lined with plastic liners in the 1990's. Starting in 2010, sections of the water delivery/conveyance pipes have been replaced.



BPH Facility Maintenance and Renovation			
Maintenance		Renovation	
Facility Archaeological Survey	\$ 20,000	Facility Archaeological Survey	\$ 20,000
Replace Water Pipes	500,000	Replace Water Pipes	500,000
Hatchery Signage	16,000	Pond earth movement, redo drain, Kettles	2,700,000
Resurface bottoms and repair outflow box	100,000	Line ponds	300,000
Replace Catwalks and Staircases	40,000	Install canopies	25,000
Replace valves and steps at outflow boxes	7,000	Install flow meters	40,000
Replace Damage liners	300,000	Install inflow turnout pipe (parking lot)	20,000
Replace drain screens	3,000	Purchase UTV with lift box and winch	16,000
		Electricity to ponds	400,000
Total	\$ 986,000	Total	\$ 4,021,000

The department recently acquired the adjacent property to the west of BPH for native fish production which consists of 31.7 acres of land with water rights. This new native fish facility will support production ponds, a hatchery building and a visitor center. BPH will be returned to warm water sport fish production. There is a reasonable amount of work that the existing facility needs in order to function efficiently and to grow sport fish.

The status quo approach could limit or eliminate the warm water fish culture capabilities and the future of the native fish culture and distribution could be seriously affected. The maintenance approach will allow BPH to maintain current production of native fish. Warm water sport fish will increase but will be limited to approximately 3.6 acres.

Under this approach the facility would not be utilized to its maximum capacity. The estimated cost for the current facility maintenance is around \$986,000 which includes the replacement of water pipes and drainage lines, replacement of catwalks, valves, and the resurfacing of pond bottoms.

By selecting the renovation approach the facility will become fully operational and will allow the growth of the warm water sport fisheries. The renovation includes the replacement of water pipes, pond earth movement, water flow meters, new drain and water supply pipes, kettles and liner on the production ponds. The renovation cost is estimated to be around \$4,021,000.

Budget Approach 1: Maintaining Status Quo of Operations												
* Assuming Inflation rate of 3%	FY'15	FY'16	FY'17	FY'18	FY'19	FY'20	FY'21	FY'22	FY'23	FY'24	FY'25	FY'26
Employee Salaries and Benefits	\$1,681,776.00	\$1,681,776.00	1,732,229.28	1,784,196.16	1,837,722.04	1,892,853.70	1,949,639.32	2,008,128.50	2,068,372.35	2,130,423.52	2,194,336.23	2,260,166.31
Operations	898,244.00	1,044,429.00	925,191.32	952,947.06	981,535.47	1,010,981.54	1,041,310.98	1,072,550.31	1,104,726.82	1,137,868.62	1,172,004.68	1,207,164.82
Maintenance	38,363.39	38,363.39	39,514.29	40,699.72	41,920.71	43,178.33	44,473.68	45,807.89	47,182.13	48,597.59	50,055.52	51,557.19
Others	25,300.00	25,300.00	26,059.00	26,840.77	27,645.99	28,475.37	29,329.63	30,209.52	31,115.81	32,049.28	33,010.76	34,001.08
Total	\$2,643,683.39	\$2,789,868.39	\$2,722,993.89	\$2,804,683.71	\$2,888,824.22	\$2,975,488.95	\$3,064,753.61	\$3,156,696.22	\$3,251,397.11	\$3,348,939.02	\$3,449,407.19	\$3,552,889.41
Budget for Approach 2: Operations and Major Maintenance												
* Assuming Inflation rate of 3%	FY'15	FY'16	FY'17	FY'18	FY'19	FY'20	FY'21	FY'22	FY'23	FY'24	FY'25	FY'26
Budget Option 1	\$2,643,683.39	\$2,789,868.39	\$2,722,993.89	\$2,804,683.71	\$2,888,824.22	\$2,975,488.95	\$3,064,753.61	\$3,156,696.22	\$3,251,397.11	\$3,348,939.02	\$3,449,407.19	\$3,552,889.41
Facilities Major Maintenance			660,000.00	435,200.00	1,353,500.00	1,211,000.00	2,089,000.00	854,000.00	279,500.00	250,000.00	250,000.00	250,000.00
Total	\$2,643,683.39	\$2,789,868.39	\$3,382,993.89	\$3,239,883.71	\$4,242,324.22	\$4,186,488.95	\$5,153,753.61	\$4,010,696.22	\$3,530,897.11	\$3,598,939.02	\$3,699,407.19	\$3,802,889.41
Budget for Approach 3: Renovation and Expansion												
* Assuming Inflation rate of 3%	FY'15	FY'16	FY'17	FY'18	FY'19	FY'20	FY'21	FY'22	FY'23	FY'24	FY'25	FY'26
Budget Option 1	\$2,643,683.39	\$2,789,868.39	\$2,722,993.89	\$2,804,683.71	\$2,888,824.22	\$2,975,488.95	\$3,064,753.61	\$3,156,696.22	\$3,251,397.11	\$3,348,939.02	\$3,449,407.19	\$3,552,889.41
Maintenance			300,000.00	309,000.00	318,270.00	327,818.10	337,652.64	347,782.22	358,215.69	368,962.16	380,031.02	391,431.96
Renovation Cost												
SSH			604,000.00	1,510,000.00	906,000.00							
SCH				1,057,000.00		528,500.00	2,642,500.00	4,228,000.00	2,114,000.00			
BPH				402,100.00	201,050.00	1,005,250.00	1,608,400.00	804,200.00				
**New Acquired property				852,000.00	426,000.00	2,130,000.00	3,408,000.00	1,704,000.00				
CCH						1,204,000.00	1,204,000.00	1,806,000.00	4,816,000.00	3,010,000.00		
TCH								602,000.00	301,000.00	1,806,000.00	2,408,000.00	903,000.00
PSH							522,000.00	522,000.00	1,566,000.00	1,044,000.00	1,044,000.00	522,000.00
Total	\$2,643,683.39	\$2,789,868.39	\$3,626,993.89	\$6,934,783.71	\$4,740,144.22	\$8,171,057.05	\$12,787,306.26	\$13,170,678.45	\$12,406,612.80	\$9,577,901.18	\$7,281,438.22	\$5,369,321.36

** The renovation cost could be reduce by developing mitigation contracts



Expansions for Fish Hatcheries

New Acquired Land (Page Property) - The construction of a new hatchery on the acquired land will cost approximately \$8,520,000. The new facility will include grow out line ponds, inside raceways, and a water discharge treatment basin. The construction of a new hatchery could allow the development of a strong partnership with other institutions dedicated to the conservation of native species for present and future generations. This new facility would expand our customer service by the construction of a visitor center dedicated only to native species.

Potential Cold Water Sport Fish Hatchery - In addition, to a small expansion/renovation at the existing coldwater hatcheries, consideration should be given to the purchase of a new property with sufficient land and secured water rights to produce trout. The facility will house grow out raceways and settling basins capable to produce additional 50,000 to 80,000 pounds of trout.

Potential Warm Water Sport Fish Hatchery - Arizona Game and Fish department manages warm water fishing opportunities in about 355,000 acres of impounded water (lakes, reservoirs, ponds, and tanks) and 35,840 acres of flowing water (about 1,400 linear miles.) Furthermore, the department manages 36 community waters in partnership with municipal parks in Arizona.

In 2013, among active anglers of warm water fish, 30% fished for catfish, 21% for crappie, 13% for sun fish and 63% fished for bass. Bass account for most fishing days: smallmouth/largemouth bass were fished for on 39.7% of angler days.

The current difference shortfall on production of warm water fish is approximately 30,000 pounds. This deficit amounts to 230,000 pounds when the catfish destined for the Community Fishing Program are included. The increase in demand, the decrease in water due to drought, and the several fish kills that have occurred in lakes and reservoirs due to Golden algae make it imperative to develop a new warm water sport fish hatchery.

For the above mentioned reasons, the future plan and construction of a new state-of-the-art production and broodstock facility is necessary. The new facility would offer expanded production capability and operational flexibility. This new hatchery would produce three to four million fingerlings of various species: largemouth bass, channel catfish, bluegill, Redear sunfish and Walleye for stocking into Arizona lakes and community waters.

This facility would need to include 30 one acre and 10 half acre line ponds for production with kettles, indoor building with raceways, an incubator room, indoor shipping and holding tanks, a water storage reservoir, laboratory, quarantine tanks, visitor center, garage shop, feed storage room and staff support facilities. The cost and design of this facility would be in excess of \$30 million dollars. The requirements to this hatchery are 150 acres of land with secured water rights. The source of water for the facility needs to be free of diseases or pathogens (preference ground water or spring source); the water system should deliver between 2000 – 3,000 gpm. This new facility would enhance and secure the warm water sport fisheries in Arizona for the next 25 years. We estimate the overall cost for this facility would be approximately \$45 million dollars.

BUDGET AND TIME FRAME FOR NEW COLDWATER AND WARMWATER HATCHERIES									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Total
New Coldwater Hatchery	\$4,900,000.00	\$1,600,000.00	\$1,000,000.00	\$3,000,000.00	\$4,000,000.00	\$2,400,000.00			\$16,900,000.00
New Warmwater Hatchery	\$15,000,000.00	\$3,000,000.00	\$1,000,000.00	\$6,000,000.00	\$8,000,000.00	\$5,000,000.00	\$5,000,000.00	\$2,000,000.00	\$45,000,000.00

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
LAND ACQUISITION/ DESIGN/PLANNING								
New Coldwater Hatchery								
New Warmwater Hatchery								
NEPA/EAC/SUP								
New Coldwater Hatchery								
New Warmwater Hatchery								
DEVELOPMENT								
New Coldwater Hatchery								
New Warmwater Hatchery								

Return on Investment Analysis

An analysis of return on investment was performed for each facility to evaluate maintenance approach and renovation-expansion approach. These approaches were compared against purchase of fish from external sources. Also, its important clarify that the analysis was performed over 25 years period (2017 - 2041) which is estimated duration of the infrastructure after the renovation-expansion approach. In additions the possibility of purchase fish from external sources it is not realistic for the following reasons:

- There is not a vendor that can provide all the fish require from the state and distribute the fish to all the locations with the frequency require.
- There is not commercial facility that can produce and commercialize Apache trout.
- The Department will lose control of production and the flexibility to respond to unexpected events making rapid adjustments or changes to the fish production.
- The Department will lose control of fish health for the stocked fish in the state, increasing the risk of introduction of undesired diseases or pathogens.

Sterling Springs Hatchery	End of Year 2041
Operation and Maintenance	\$4,312,329.37
Operations and Renovation-Expansion	\$6,060,650.31
Purchasing of Fingerlings (1.3 million)	\$14,575,673.00

Silver Creek Hatchery	End of Year 2041
Operation and Maintenance (20K lbs.)	\$7,284,306.89
Purchasing of Fish (20K lbs.)	\$6,286,640.00
Operations and Renovation-Expansion (80K lbs.)	\$19,185,695.06
Purchasing of Fish (80K lbs.)	\$21,726,249.30

*** No commercial facility can provide Apache trout*

Canyon Creek Hatchery	End of Year 2041
Operation and Maintenance (80K lbs.)	\$18,984,554.88
Purchasing of Fish (80K lbs.)	\$21,726,249.30
Operations and Renovation-Expansion (95K lbs.)	\$23,768,367.16
Purchasing of Fish (95K lbs.)	\$25,799,921.05

Tonto Creek Hatchery	End of Year 2041
Operation and Maintenance (50K lbs.)	\$16,620,026.20
Operations and Renovation (55K lbs.)	\$18,483,902.05
Purchasing of Fish (55K lbs.)	\$14,936,796.40

Page Springs Hatchery	End of Year 2041
Operation and Maintenance	\$28,501,524.85
Purchasing of Fish (216K lbs.)	\$53,772,436.00
Operations and Renovation-Expansion (230K lbs.)	\$32,000,629.69
Purchasing of Fish (230K lbs.)	\$56,221,614.50

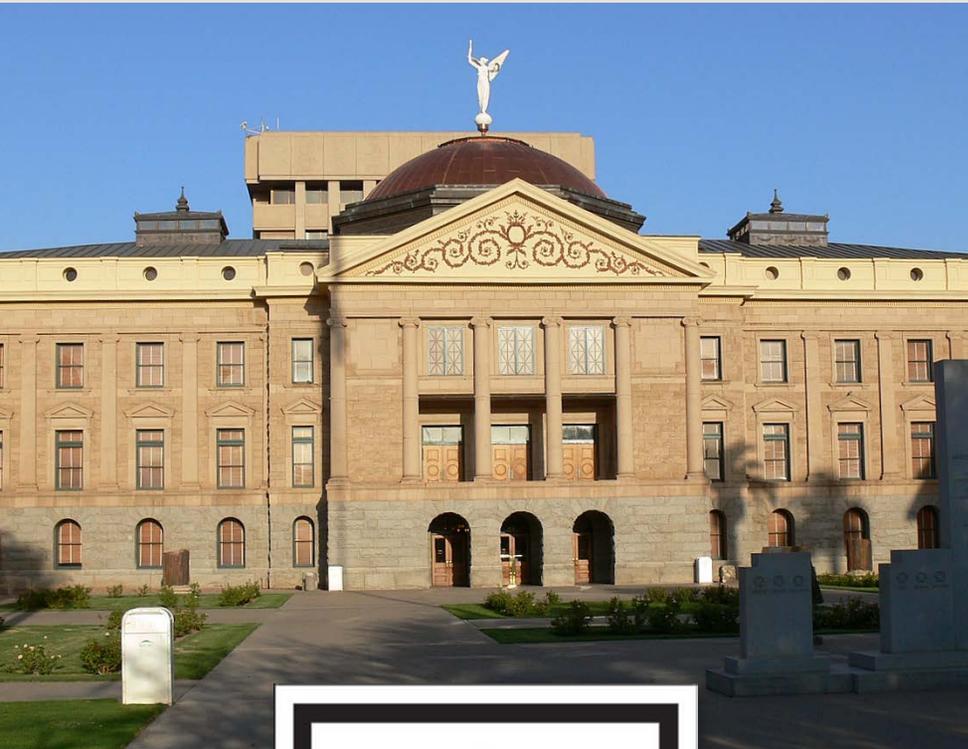
Bubbling Ponds Hatchery	End of Year 2041
Operation and Maintenance	\$11,209,089.32
Purchasing of Fish (300,000 fingerlings of Largemouth Bass)	\$16,979,796.89
Operations and Renovation-Expansion	\$12,028,574.93
Purchasing of Fish (700,000 fingerlings of Largemouth Bass)	\$39,619,526.07

New Warmwater Hatchery	End of Year 2041
Purchase, Development and Operations (3 Million LMB fingerlings and 80,000 lbs. of Bluegill)	\$60,369,380.87
Purchasing of Fish (3 Million LMB fingerlings and 80,000 lbs. of Bluegill)	\$169,797,968.88

New Coldwater Hatchery	End of Year 2041
Development and Operations (55K lbs.)	\$19,459,328.81
Purchasing of Fish (55K lbs.)	\$14,936,796.40

** Without Property price

Approach	Species and Quantity	Cost Producing the Fish in AZGFD Hatchery End of Year 2041	Total Purchase Cost and Stocking End of Year 2041
Hatcheries Maintenance and Operations	385,000 lbs. Trout, 1.3 Million Trout Fingerlings, 300,000 LMB Fingerlings and 15,000 of Native Fish	\$86,911,831.51	\$155,870,513.28
Hatcheries Renovation and Operations	500,000 lbs. Trout, 1.5 Million Trout Fingerlings, 700,000 LMB Fingerlings and 20,000 of Native Fish	\$130,987,148.01	\$185,848,234.57
New Warmwater Hatchery	3,000,000.00 LMB Fingerlings and 80,000 lbs. of Bluegill	\$62,676,977.93	\$179,797,968.88



Potential Funding Sources

The overall budget request for conducting renovations on all of the Departments current hatcheries as well as the purchase and construction of a new, state of the art, cold water and warm water sportfish facilities would require over \$111 million dollars. Preparing for the each of these options should be completed using many different business approaches. The following is a list of potential options available:

Continue to prioritize base budget and one time maintenance budget requests – This option will be required additions to the base budget of between \$30,000 and \$40,000 dollars annually. In addition completion of prioritized maintenance needs as scheduled would require additions to the one time enhancements of between \$270,000 and \$2.1 million dollars in addition to the base budget increases.

Arizona Legislature Appropriations– General Fund Tax Dollars - Legislative appropriations are a viable option that many other states have taken advantage of. In many cases the appropriations require matching funds as an incentive. In 2007, the Texas Parks and Wildlife Department created legislative bill that utilized funding from a newly developed freshwater fishing stamp funds to be matched to general appropriation dollars to begin construction of the new fish hatchery planned for Jasper in East Texas. The funding was kept in a revolving fund allocation until bulk funding was realized. Purchasing of land and construction for a warm water fish hatchery is currently projected to cost about \$45 million and a preferable option for bonding.

AZ Legislative one time grants – Economic development grants are a potential option as well. These can range between 500,000 dollars to a potential multi-million dollars grant. As shown above, the value of the Departments hatchery system to the economy of Arizona is in the billions. The economic importance of the hatcheries will assist the Department in the success of these grants.

Foundation Funding – Using a 501(c) 3 an organization, such as Wildlife for Tomorrow or AZ Sportsman’s For Wildlife, the Department could identify the need or initiative for large scale projects in which those organizations can work to find ready donators to contribute to the hatchery specific projects.

Bonding Option - Companies and governments issue bonds to fund their day-to-day operations or to finance specific projects. The basics of a bond are, when you buy a bond, you are loaning your money for a certain period of time to the issuer. In exchange, the borrower promises to pay you interest every year and to return your principal when the loan comes due. The length of time to maturity varies but would likely pose a 25 year option as the life expectancy of the hatchery renovations.

A \$45 million dollar bond paying 7% (normal bonding rate) has a value at maturity (25 years) of \$48.15 million dollars. Based on the value the payment rate of a 25 year option, this would cost the Department an estimated payback of approximately \$1.9 million dollars annually in addition to the existing annual budgets. A recent example of this option was implemented in Nevada. The Nevada Division of Wildlife bonded 10 million dollars in 2005 to construct the Lake Mead State Hatchery. Nevada then used a portion of their Sportfish Restoration funds annually to pay back the \$10 million dollars amount plus interest over a ten year period.

Buy out additional SFR funding from Bubbling Ponds - When Page Springs State Fish Hatchery was renovated in 1991, Bubbling Ponds was used as cash match to bring in the renovation funds that were available. As such, the value of Bubbling Ponds Hatchery would be available to buy out in current dollar amount. Since Bubbling Ponds has a high value for northern Mexican and narrowheaded gartersnakes, Heritage funding may be available for the purchase. We estimate the current value of Bubbling Ponds to exceed 8 million dollars. Buying out the property using Heritage would have little change to the overall objectives of Bubbling Ponds but would provide Sportfish dollars to be used completing much of the needs listed above.

As discussed, there are many available options to repair the current state of the hatcheries in Arizona. None of which are likely to resolve the issues by themselves. A hybrid approach of all funding options based on Department priorities will likely be the best direction and plan forward.







Arizona Game & Fish Department
5000 W. Carefree Highway
Phoenix, AZ 85086
(602) 942-3000 | www.azgfd.gov

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