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Warm Springs Spring Chinook- Integrated in the Deschutes Subbasin • READ ONLY ACCESS

3. Benefits and Risks of the Deschutes Warm Springs Spring Chinook- Integrated Hatchery Program

This section summarizes the responses to the questions entered into the APRE Questionnaire about hatchery facilities and operations. The questions reflect standards and guidelines from two sources: IHOT and HSRG. Depending upon hatchery program purpose (harvest, conservation, research) and type (integrated or segregated), the response to each applicable question/guideline is classified into one of three categories: Guidelines Met, Guidelines Not Met, and Not Enough Information to draw a conclusion.

Criteria for Successful Outcomes

(Table entries are: Guidelines Met / Guidelines NOT Met/ Not Enough Information)

Hatchery Practices	Target Stock 			Other Stocks			Environment (Fish passage, NPDES Discharge)	Implementation Monitoring
	Harvest	Biological Significance	Survival	Ecological Interactions	Genetic Interactions	Harvest Interactions		
Broodstock Choice	2 / 0 / 0	1 / 0 / 0	1 / 0 / 0	1 / 1 / 0	1 / 0 / 0	1 / 0 / 0		1 / 0 / 0
Broodstock Collection	9 / 3 / 0	4 / 0 / 0	14 / 3 / 0	7 / 0 / 0	5 / 0 / 0			10 / 2 / 0
Adult Holding	3 / 0 / 0		4 / 4 / 0				1 / 0 / 0	3 / 0 / 0
Spawning	4 / 1 / 0		4 / 3 / 0	0 / 1 / 0				
Incubation	7 / 9 / 0	1 / 3 / 0	11 / 13 / 0	2 / 1 / 0			1 / 0 / 0	6 / 5 / 0
Rearing	19 / 11 / 0	2 / 4 / 0	21 / 15 / 0	7 / 4 / 0			3 / 0 / 0	11 / 8 / 0
Release	11 / 6 / 1	3 / 3 / 0	11 / 5 / 1	8 / 4 / 0	4 / 1 / 0	5 / 0 / 0	2 / 0 / 0	10 / 5 / 1
Facilities	3 / 0 / 0		3 / 0 / 0				3 / 2 / 0	1 / 0 / 0
Effectiveness Monitoring	1 / 0 / 0	2 / 2 / 0	4 / 2 / 0					10 / 2 / 0
Subtotal:	59 / 30 / 1	13 / 12 / 0	73 / 45 / 1	25 / 11 / 0	10 / 1 / 0	6 / 0 / 0	10 / 2 / 0	52 / 22 / 1
Education	16 / 0 / 0							
Accountability	8 / 1 / 1							

Deschutes Warm Springs Spring Chinook- Integrated Hatchery Benefit and Risk Detail

Broodstock Choice as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[17](#) "This program uses a broodstock representing populations native or adapted to the watershed, which increases the likelihood of long term survival of the stock, helps avoid loss of among population diversity, and reduces the likelihood of unexpected ecological interactions."

[21](#) The broodstock chosen is likely to have the life history traits to meet harvest goals for the target stocks without adversely impacting other stocks.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[17](#) "This program uses a broodstock representing populations native or adapted to the watershed, which increases the likelihood of long term survival of the stock, helps avoid loss of among population diversity, and reduces the likelihood of unexpected ecological interactions."

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [17](#) "This program uses a broodstock representing populations native or adapted to the watershed, which increases the likelihood of long term survival of the stock, helps avoid loss of among population diversity, and reduces the likelihood of unexpected ecological interactions."
-

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated
Program Purpose: Harvest, Conservation/recovery, Research and/or education
Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

- [17](#) "This program uses a broodstock representing populations native or adapted to the watershed, which increases the likelihood of long term survival of the stock, helps avoid loss of among population diversity, and reduces the likelihood of unexpected ecological interactions."
-

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

- [20](#) The broodstock chosen poses a risk to other populations in the watershed from pathogen transmission
-

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated
Program Purpose: Harvest, Conservation/recovery, Research and/or education
Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

- [17](#) "This program uses a broodstock representing populations native or adapted to the watershed, which increases the likelihood of long term survival of the stock, helps avoid loss of among population diversity, and reduces the likelihood of unexpected ecological interactions."
-

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[21](#) The broodstock chosen is likely to have the life history traits to meet harvest goals for the target stocks without adversely impacting other stocks.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Choice as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[21](#) The broodstock chosen is likely to have the life history traits to meet harvest goals for the target stocks without adversely impacting other stocks.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [24](#) Collection of representative samples of both the natural and hatchery populations maintains within population diversity.
 - [31](#) Avoidance of stock transfers from outside the watershed promotes local adaptation and reduces the risk of pathogen transmission.
 - [32a](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
 - [32b](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
 - [34a](#) Following IHOTand PNFHPC standards for adult loading improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.
 - [34b](#) Following IHOTand PNFHPC stardards for adult density improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.
 - [34e](#) Broodstock security is maintained by following IHOT standards for predator control.
 - [16b](#) Use of broodstock from only on-station returns limits the potential of disease transmission and promotes local adaptation
 - [16h](#) Spawning in a covered facility reduces the risk of eggs becoming water-hardened prior to fertilization.
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [33](#) Pre-spawning mortality greater than 10% poses a risk to maintaining effective population size and a risk of domestication selection
 - [34c](#) Failure to following IHOT standards for water quality poses risks to broodstock security and a proper maturation and reproduction.
 - [34d](#) Broodstock security would be improved if IHOT standards were followed for alarm systems.
-

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [23](#) no benefit statement available

- [24](#) Collection of representative samples of both the natural and hatchery populations maintains within population diversity.
- [31](#) Avoidance of stock transfers from outside the watershed promotes local adaptation and reduces the risk of pathogen transmission.
- [30](#) The rate of hatchery contribution to natural spawning populations maintains among population diversity and promotes adaptation to the natural environment.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [22](#) Collection of a sufficient number of donors to minimize founder effects maintains within population diversity.
- [23](#) no benefit statement available
- [24](#) Collection of representative samples of both the natural and hatchery populations maintains within population diversity.
- [27](#) Sufficient broodstock are collected to maintain genetic variation in the population
- [31](#) Avoidance of stock transfers from outside the watershed promotes local adaptation and reduces the risk of pathogen transmission.
- [30](#) The rate of hatchery contribution to natural spawning populations maintains among population diversity and promotes adaptation to the natural environment.
- [32a](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
- [32b](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
- [32c](#) "Following IHOTand PNFHPC guidelines for broodstock holding and disposal of carcasses increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
- [34a](#) Following IHOTand PNFHPC standards for adult loading improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.
- [34b](#) Following IHOTand PNFHPC stardards for adult density improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.
- [34e](#) Broodstock security is maintained by following IHOT standards for predator control.
- [16b](#) Use of broodstock from only on-station returns limits the potential of disease transmission and promotes local adaptation
- [16h](#) Spawning in a covered facility reduces the risk of eggs becoming water-hardened prior to fertilization.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [33](#) Pre-spawning mortality greater than 10% poses a risk to maintaining effective population size and a risk of domestication selection
- [34c](#) Failure to following IHOT standards for water quality poses risks to broodstock security and a proper maturation and reproduction.

[34d](#) Broodstock security would be improved if IHOT standards were followed for alarm systems.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[23](#) no benefit statement available

[24](#) Collection of representative samples of both the natural and hatchery populations maintains within population diversity.

[32a](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "

[32b](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "

[32c](#) "Following IHOTand PNFHPC guidelines for broodstock holding and disposal of carcasses increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "

[34a](#) Following IHOTand PNFHPC standards for adult loading improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.

[34b](#) Following IHOTand PNFHPC standards for adult density improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[23](#) no benefit statement available

[24](#) Collection of representative samples of both the natural and hatchery populations maintains within population diversity.

- [31](#) Avoidance of stock transfers from outside the watershed promotes local adaptation and reduces the risk of pathogen transmission.
- [30](#) The rate of hatchery contribution to natural spawning populations maintains among population diversity and promotes adaptation to the natural environment.
- [16b](#) Use of broodstock from only on-station returns limits the potential of disease transmission and promotes local adaptation
-

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated
Program Purpose: Harvest, Conservation/recovery, Research and/or education
Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Environment for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated
Program Purpose: Harvest, Conservation/recovery, Research and/or education
Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Broodstock Collection as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [24](#) Collection of representative samples of both the natural and hatchery populations maintains within population diversity.
- [27](#) Sufficient broodstock are collected to maintain genetic variation in the population
- [29](#) Having established guidelines for acceptable contribution of hatchery origin fish to natural spawning provides a clear performance standard for evaluating the program.
- [30](#) The rate of hatchery contribution to natural spawning populations maintains among population diversity and promotes adaptation to the natural environment.
- [32a](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
- [32b](#) "Adherence to IHOT and PNFHPC guidelines for broodstock fish health inspections increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
- [32c](#) "Following IHOTand PNFHPC guidelines for broodstock holding and disposal of carcasses increases the likelihood of preventing importation, dissemination and amplification of fish pathogens. "
- [34a](#) Following IHOTand PNFHPC standards for adult loading improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.
- [34b](#) Following IHOTand PNFHPC standards for adult density improves broodstock security and increases the likelihood of preventing dissemination and amplification of fish pathogens.
- [34e](#) Broodstock security is maintained by following IHOT standards for predator control.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [34c](#) Failure to following IHOT standards for water quality poses risks to broodstock security and a proper maturation and reproduction.
- [34d](#) Broodstock security would be improved if IHOT standards were followed for alarm systems.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Adult Holding as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [12j](#) "Use of water for adult holding that meets IHOT standards for temperature promotes survival, proper maturation and gamete development."
- [12k](#) "Use of water for adult holding that meet IHOT standards for chemical composition promotes survival, proper maturation and gamete development."
- [12o](#) Broodstock security is maintained by back-up power generation for the pumped water supply.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Adult Holding as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated
Program Purpose: Harvest, Conservation/recovery, Research and/or education
Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Adult Holding as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated
Program Purpose: Harvest, Conservation/recovery, Research and/or education
Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

[12d](#) Fish health is promoted by the absence of specific pathogens during adult holding.

[12j](#) "Use of water for adult holding that meets IHOT standards for temperature promotes survival, proper maturation and gamete development."

[12k](#) "Use of water for adult holding that meet IHOT standards for chemical composition promotes survival, proper maturation and gamete development."

[12o](#) Broodstock security is maintained by back-up power generation for the pumped water supply.

Listed below are the hatchery practices that might place program goals at risk. ▲
For further explanation, click the number to the left of the statement.

[12c](#) There is a risk to fish health due to a lack of pathogen free water for adult holding.

[12e](#) Because the water source for adult holding is not fish free it may contain pathogens posing a risk to fish health.

[12f](#) Access by anadromous fish to the adult holding water supply poses a risk of pathogen transmission.

[12n](#) Absence of flow and/or level alarms at the holding pond may pose a risk to broodstock security.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Adult Holding as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Adult Holding as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Adult Holding as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Adult Holding as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[12g](#) Hatchery intake structures prevent entrapment in hatchery facilities and impingement of migrating or rearing juveniles

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Adult Holding as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[12j](#) "Use of water for adult holding that meets IHOT standards for temperature promotes survival, proper maturation and gamete development."

[12k](#) "Use of water for adult holding that meet IHOT standards for chemical composition promotes survival, proper maturation and gamete development."

[12g](#) Hatchery intake structures prevent entrapment in hatchery facilities and impingement of migrating or rearing juveniles

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[35](#) Random mating maintains within population diversity.

- [36](#) Single family pairing increases the effective population size of the hatchery stock.
 - [38](#) Use of precocious males for spawning as a set percentage or in proportion to their contribution to the adult run promotes within population diversity.
 - [40](#) Proper disinfection procedures increase the likelihood of preventing dissemination and amplification of pathogens in the hatchery.
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [37](#) Not using of back-up males in the spawning protocol increases the risk of unfertilized eggs and loss of genetic diversity in the broodstock.
-

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Biological Significance for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [35](#) Random mating maintains within population diversity.
 - [36](#) Single family pairing increases the effective population size of the hatchery stock.
 - [38](#) Use of precocious males for spawning as a set percentage or in proportion to their contribution to the adult run promotes within population diversity.
 - [40](#) Proper disinfection procedures increase the likelihood of preventing dissemination and amplification of pathogens in the hatchery.
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [37](#) Not using of back-up males in the spawning protocol increases the risk of unfertilized eggs and loss of genetic diversity in the broodstock.
- [39](#) no risk statement available

[41](#) Failure to collect and disinfect spawning waste poses a risk of dissemination and amplification of pathogens in the receiving habitat.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[41](#) Failure to collect and disinfect spawning waste poses a risk of dissemination and amplification of pathogens in the receiving habitat.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Spawning as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[43](#) no benefit statement available

Proper egg inventory and removal procedures increase the likelihood of meeting release goals and preventing dissemination or amplification of

- [54](#) pathogens.
- [13k](#) Use of water for incubation that meets IHOT standards for temperature promotes survival and proper development of eggs and alevin.
- [13l](#) Use of water for incubation that meets IHOT standards promotes survival and proper development of eggs and alevin.
- [13p](#) Security during incubation is maintained by back-up power generation for the pumped water supply.
- [51e](#) Use of IHOT density recommendations during incubation promote security of eggs and alevin and allow for optimum fry development.
- [55a](#) Removing fry from incubators when 80-90% of fry have utilized 80-90% of their yolk-sac promotes growth and reduces fish health risks from early ponding.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [42](#) Incubation conditions that result in unequal survival of all segments of the population pose a risk of domestication selection and loss of genetic variability.
- [46](#) Not allowing volitional ponding of fry poses a risk of loss of genetic variability.
- [45](#) Non-random culling of eggs increases the risk of loss of genetic variability during incubation.
- [13i](#) Lack of natural water temperature profiles may contribute to domestication selection during incubation.
- [51a](#) Use of water for incubation outside the recommended range in IHOT standards for water quality may adversely affect survival and development of eggs and alevin.
- [51b](#) Failing to meet IHOT flow recommendations during incubation poses a risk to the security of eggs and alevin and may not allow for optimum fry development.
- [51c](#) Use of water for incubation outside the recommended range in IHOT standards for temperature may adversely affect survival and proper development of eggs and alevin.
- [51d](#) Failing to meet IHOT recommendations for using substrate during incubation may allow excess alevin movement and reduces energetic efficiency.
- [55d](#) no risk statement available

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [55a](#) Removing fry from incubators when 80-90% of fry have utilized 80-90% of their yolk-sac promotes growth and reduces fish health risks from early ponding.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [46](#) Not allowing volitional ponding of fry poses a risk of loss of genetic variability.
- [45](#) Non-random culling of eggs increases the risk of loss of genetic variability during incubation.

[13i](#) Lack of natural water temperature profiles may contribute to domestication selection during incubation.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [43](#) no benefit statement available
 - [53](#) Monitoring eggs to determine fertilization efficiency and embryonic development increases the likelihood of meeting release goals and reduces the risk of domestication selection.
 - [54](#) Proper egg inventory and removal procedures increase the likelihood of meeting release goals and preventing dissemination or amplification of pathogens.
 - [56](#) Properly discarding dead or culled eggs increases the likelihood of preventing dissemination and amplification of pathogens in the hatchery.
 - [13d](#) Fish health is promoted by the absence of specific pathogens during incubation.
 - [13h](#) "This program uses natal stream water for incubation, which promotes development of eggs and alevins synchronous with natural stocks and reduces the risk of domestication selections."
 - [13k](#) Use of water for incubation that meets IHOT standards for temperature promotes survival and proper development of eggs and alevin.
 - [13l](#) Use of water for incubation that meets IHOT standards promotes survival and proper development of eggs and alevin.
 - [13p](#) Security during incubation is maintained by back-up power generation for the pumped water supply.
 - [51e](#) Use of IHOT density recommendations during incubation promote security of eggs and alevin and allow for optimum fry development.
 - [55a](#) Removing fry from incubators when 80-90% of fry have utilized 80-90% of their yolk-sac promotes growth and reduces fish health risks from early ponding.
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [42](#) Incubation conditions that result in unequal survival of all segments of the population pose a risk of domestication selection and loss of genetic variability.
- [46](#) Not allowing volitional ponding of fry poses a risk of loss of genetic variability.
- [45](#) Non-random culling of eggs increases the risk of loss of genetic variability during incubation.
- [13c](#) There is a risk to fish health due to the lack of pathogen-free water for incubation.
- [13e](#) Because the water source for incubation is not fish free it may contain pathogens posing a risk to fish health.
- [13f](#) Access by anadromous fish to the incubation water supply poses a risk of pathogen transmission.
- [13i](#) Lack of natural water temperature profiles may contribute to domestication selection during incubation.
- [13o](#) Absence of flow alarms at the incubation units may pose a risk to the security of incubating eggs and alevin.
- [51a](#) Use of water for incubation outside the recommended range in IHOT standards for water quality may adversely affect survival and development of eggs and alevin.
 - Failing to meet IHOT flow recommendations during incubation poses a risk to the security of eggs and alevin and may not allow for optimum fry

[51b](#) development.

[51c](#) Use of water for incubation outside the recommended range in IHOT standards for temperature may adversely affect survival and proper development of eggs and alevin.

[51d](#) Failing to meet IHOT recommendations for using substrate during incubation may allow excess alevin movement and reduces energetic efficiency.

[55d](#) no risk statement available

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[54](#) Proper egg inventory and removal procedures increase the likelihood of meeting release goals and preventing dissemination or amplification of pathogens.

[56](#) Properly discarding dead or culled eggs increases the likelihood of preventing dissemination and amplification of pathogens in the hatchery.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[13i](#) Lack of natural water temperature profiles may contribute to domestication selection during incubation.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[13r](#) Hatchery intake structures prevent entrapment in hatchery facilities and impingement of migrating or rearing juveniles

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Incubation as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[53](#) Monitoring eggs to determine fertilization efficiency and embryonic development increases the likelihood of meeting release goals and reduces the risk of domestication selection.

[54](#) Proper egg inventory and removal procedures increase the likelihood of meeting release goals and preventing dissemination or amplification of pathogens.

[13k](#) Use of water for incubation that meets IHOT standards for temperature promotes survival and proper development of eggs and alevin.

[13l](#) Use of water for incubation that meets IHOT standards promotes survival and proper development of eggs and alevin.

- [13r](#) Hatchery intake structures prevent entrapment in hatchery facilities and impingement of migrating or rearing juveniles
 - [51e](#) Use of IHOT density recommendations during incubation promote security of eggs and alevin and allow for optimum fry development.
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [13i](#) Lack of natural water temperature profiles may contribute to domestication selection during incubation.
 - [51a](#) Use of water for incubation outside the recommended range in IHOT standards for water quality may adversely affect survival and development of eggs and alevin.
 - [51b](#) Failing to meet IHOT flow recommendations during incubation poses a risk to the security of eggs and alevin and may not allow for optimum fry development.
 - [51c](#) Use of water for incubation outside the recommended range in IHOT standards for temperature may adversely affect survival and proper development of eggs and alevin.
 - [51d](#) Failing to meet IHOT recommendations for using substrate during incubation may allow excess alevin movement and reduces energetic efficiency.
-

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [58](#) Providing rearing conditions that improve survival of all segments of the population increases the likelihood of meeting harvest goals.
- [60](#) Random culling of juveniles over all segments of the population maintains genetic variability during rearing.
- [66](#) Use of diet and growth regimes that mimic natural seasonal growth patterns promote proper smoltification and should produce adults that maintain the age structure of the natural population.
- [67](#) Periodic cleaning of rearing containers maintains rearing water quality and promotes proper fish health.
- [76](#) Accurate estimation of the pond populations increase the likelihood of meeting growth rate and fish size goals.
- [14n](#) Use of water for rearing that meets IHOT standards promotes survival and proper development of cultured fish.
- [14r](#) Security during rearing is maintained by back-up power generation for the pumped water supply.
- [64b](#) Conducting periodic feed quality analysis ensures sufficient nutrition is provided to achieve proper growth and smoltification.
- [64c](#) Storing feed as described in the IHOT standards ensures that nutritional elements in feed are maintained to achieve proper growth and smoltification.
- [65a](#) "Following proper feeding rates to achieve the desired growth rate improves the likelihood of producing fish that are physiologically fit, properly smolted, and that maintain the age structure of natural populations. "
- [65b](#) Providing feed to achieve the desired body composition supports natural physiological functions and may improve survival.
- [65c](#) Feeding to achieve the desired condition factor is an indicator of proper fish health and physiological smolt quality.
- [68a](#) Reducing rearing density below agency guidelines may improve smolt to adult survival through improved physiological factors and disease resistance.
- [68g](#) Providing artificial cover increases the development of appropriate body camouflage and may improve behavioral fitness.
- [72a](#) Use of water for rearing that meets IHOT water quality standards promotes survival and proper development of cultured fish.

- [72c](#) Following IHOT standards for predator control during rearing reduces the likelihood of losses from predation.
- [72d](#) "Following IHOT standards for juvenile loading maintains proper dissolved oxygen levels promoting fish health, growth and survival, and increases the likelihood of preventing dissemination and amplification of fish pathogens. "
- [72e](#) "Following IHOT standards for juvenile density maintain fish health, growth, and survival, and increases the likelihood of preventing dissemination and amplification of fish pathogens. "
- [71b](#) Basing juvenile rearing density and loading standards on survival studies conducted on-site increases the likelihood that hatchery carrying capacity is understood and that harvest or conservation goals will be met.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [57](#) Rearing conditions that result in unequal survival of all segments of the population pose a risk of domestication selection and loss of genetic variability.
- [14i](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [14j](#) Use of rearing water that is chemically similar to natural stream population increases the possibility of straying and poses a risk to loss of among population diversity
- [14m](#) Use of water for incubation outside the recommended range in IHOT standards may adversely affect survival and proper development of cultured fish.
- [64a](#) Improper feeding rates do not achieve desired size reduces the likelihood of attaining harvest or conservation goals.
- [68b](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [68c](#) Not actively simulating photoperiod may lead to domestication selection during rearing.
- [68d](#) Rearing under normal hatchery hydraulic characteristics may not provide enough exercise to sustain predator avoidance behavior.
- [68e](#) Feeding under normal hatchery conditions orients feeding fish to the surface and may make them more vulnerable to predators.
- [68f](#) Lack of predator avoidance training may decrease smolt to adult survival.
- [72b](#) Absence of alarms that meet IHOT standards increases the likelihood of catastrophic losses in the hatchery.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [60](#) Random culling of juveniles over all segments of the population maintains genetic variability during rearing.
- [14h](#) Use of natal stream water for rearing promotes growth of fish and smoltification synchronous with natural stocks.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [14i](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [14j](#) Use of rearing water that is chemically similar to natural stream population increases the possibility of straying and poses a risk to loss of among population diversity

[68b](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.

[68c](#) Not actively simulating photoperiod may lead to domestication selection during rearing.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
For further explanation, click the number to the left of the statement.

Rearing as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
For further explanation, click the number to the left of the statement.

[58](#) Providing rearing conditions that improve survival of all segments of the population increases the likelihood of meeting harvest goals.

[60](#) Random culling of juveniles over all segments of the population maintains genetic variability during rearing.

[66](#) Use of diet and growth regimes that mimic natural seasonal growth patterns promote proper smoltification and should produce adults that maintain the age structure of the natural population.

[67](#) Periodic cleaning of rearing containers maintains rearing water quality and promotes proper fish health.

[76](#) Accurate estimation of the pond populations increase the likelihood of meeting growth rate and fish size goals.

[14d](#) Fish health is promoted by the absence of specific pathogens during rearing.

[14h](#) Use of natal stream water for rearing promotes growth of fish and smoltification synchronous with natural stocks.

[14n](#) Use of water for rearing that meets IHOT standards promotes survival and proper development of cultured fish.

[14r](#) Security during rearing is maintained by back-up power generation for the pumped water supply.

[64b](#) Conducting periodic feed quality analysis ensures sufficient nutrition is provided to achieve proper growth and smoltification.

[64c](#) Storing feed as described in the IHOT standards ensures that nutritional elements in feed are maintained to achieve proper growth and smoltification.

[65a](#) "Following proper feeding rates to achieve the desired growth rate improves the likelihood of producing fish that are physiologically fit, properly smolted, and that maintain the age structure of natural populations. "

[65b](#) Providing feed to achieve the desired body composition supports natural physiological functions and may improve survival.

[65c](#) Feeding to achieve the desired condition factor is an indicator of proper fish health and physiological smolt quality.

[68a](#) Reducing rearing density below agency guidelines may improve smolt to adult survival through improved physiological factors and disease resistance.

[68g](#) Providing artificial cover increases the development of appropriate body camouflage and may improve behavioral fitness.

[72a](#) Use of water for rearing that meets IHOT water quality standards promotes survival and proper development of cultured fish.

[72c](#) Following IHOT standards for predator control during rearing reduces the likelihood of losses from predation.

[72d](#) "Following IHOT standards for juvenile loading maintains proper dissolved oxygen levels promoting fish health, growth and survival, and increases the likelihood of preventing dissemination and amplification of fish pathogens. "

[72e](#) "Following IHOT standards for juvenile density maintain fish health, growth, and survival, and increases the likelihood of preventing dissemination and amplification of fish pathogens. "

[71b](#) Basing juvenile rearing density and loading standards on survival studies conducted on-site increases the likelihood that hatchery carrying capacity is understood and that harvest or conservation goals will be met.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [57](#) Rearing conditions that result in unequal survival of all segments of the population pose a risk of domestication selection and loss of genetic variability.
- [14c](#) There is a risk to fish health due to the lack of pathogen-free water for rearing.
- [14e](#) Because the water source for rearing is not fish free it may contain pathogens posing a risk to fish health.
- [14f](#) Access by anadromous fish to the rearing water supply poses a risk of pathogen transmission.
- [14i](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [14j](#) Use of rearing water that is chemically similar to natural stream population increases the possibility of straying and poses a risk to loss of among population diversity
- [14m](#) Use of water for incubation outside the recommended range in IHOT standards may adversely affect survival and proper development of cultured fish.
- [14q](#) Absence of flow and/or level alarms at rearing ponds may pose a risk to the security of the cultured fish.
- [64a](#) Improper feeding rates do not achieve desired size reduces the likelihood of attaining harvest or conservation goals.
- [68b](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [68c](#) Not actively simulating photoperiod may lead to domestication selection during rearing.
- [68d](#) Rearing under normal hatchery hydraulic characteristics may not provide enough exercise to sustain predator avoidance behavior.
- [68e](#) Feeding under normal hatchery conditions orients feeding fish to the surface and may make them more vulnerable to predators.
- [68f](#) Lack of predator avoidance training may decrease smolt to adult survival.
- [72b](#) Absence of alarms that meet IHOT standards increases the likelihood of catastrophic losses in the hatchery.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [62](#) Following IHOT fish health guidelines increases the likelihood of preventing dissemination and amplification of pathogens in the hatchery and the receiving watershed.
- [63](#) "Use of vaccines when possible reduce the use of antimicrobial compounds, reducing the potential development of antibiotic resistance."
- [66](#) Use of diet and growth regimes that mimic natural seasonal growth patterns promote proper smoltification and should produce adults that maintain the age structure of the natural population.
- [14h](#) Use of natal stream water for rearing promotes growth of fish and smoltification synchronous with natural stocks.
- [65a](#) "Following proper feeding rates to achieve the desired growth rate improves the likelihood of producing fish that are physiologically fit, properly smolted, and that maintain the age structure of natural populations. "
- [65c](#) Feeding to achieve the desired condition factor is an indicator of proper fish health and physiological smolt quality.
- [68g](#) Providing artificial cover increases the development of appropriate body camouflage and may improve behavioral fitness.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [14i](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
 - [68b](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
 - [68c](#) Not actively simulating photoperiod may lead to domestication selection during rearing.
 - [68e](#) Feeding under normal hatchery conditions orients feeding fish to the surface and may make them more vulnerable to predators.
-

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [14k](#) Providing upstream and downstream passage of juveniles and adults supports natural distribution and productivity of naturally produced stocks.
- [14l](#) Providing upstream and downstream passage of juveniles and adults supports natural distribution and productivity of naturally produced stocks.
- [14t](#) Hatchery intake structures prevent entrapment in hatchery facilities and impingement of migrating or rearing juveniles

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Rearing as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [62](#) Following IHOT fish health guidelines increases the likelihood of preventing dissemination and amplification of pathogens in the hatchery and the receiving watershed.
- [66](#) Use of diet and growth regimes that mimic natural seasonal growth patterns promote proper smoltification and should produce adults that maintain the age structure of the natural population.
- [76](#) Accurate estimation of the pond populations increase the likelihood of meeting growth rate and fish size goals.
- [14n](#) Use of water for rearing that meets IHOT standards promotes survival and proper development of cultured fish.
- [14t](#) Hatchery intake structures prevent entrapment in hatchery facilities and impingement of migrating or rearing juveniles
- [64c](#) Storing feed as described in the IHOT standards ensures that nutritional elements in feed are maintained to achieve proper growth and smoltification.
- [68a](#) Reducing rearing density below agency guidelines may improve smolt to adult survival through improved physiological factors and disease resistance.
- [72c](#) Following IHOT standards for predator control during rearing reduces the likelihood of losses from predation.
- [72d](#) "Following IHOT standards for juvenile loading maintains proper dissolved oxygen levels promoting fish health, growth and survival, and increases the likelihood of preventing dissemination and amplification of fish pathogens. "
- [72e](#) "Following IHOT standards for juvenile density maintain fish health, growth, and survival, and increases the likelihood of preventing dissemination and amplification of fish pathogens. "
- [71b](#) Basing juvenile rearing density and loading standards on survival studies conducted on-site increases the likelihood that hatchery carrying capacity is understood and that harvest or conservation goals will be met.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [14i](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [14j](#) Use of rearing water that is chemically similar to natural stream population increases the possibility of straying and poses a risk to loss of among population diversity
- [14m](#) Use of water for incubation outside the recommended range in IHOT standards may adversely affect survival and proper development of cultured fish.

- [64a](#) Improper feeding rates do not achieve desired size reduces the likelihood of attaining harvest or conservation goals.
- [68b](#) Lack of natural water temperature profiles may lead to domestication selection during rearing.
- [68c](#) Not actively simulating photoperiod may lead to domestication selection during rearing.
- [68d](#) Rearing under normal hatchery hydraulic characteristics may not provide enough exercise to sustain predator avoidance behavior.
- [72b](#) Absence of alarms that meet IHOT standards increases the likelihood of catastrophic losses in the hatchery.

Listed below are responses that did not provide enough information to draw a conclusion. ▲
 For further explanation, click the number to the left of the statement.

Release as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲
 For further explanation, click the number to the left of the statement.

- [84](#) Releasing fish at sizes and life history stages similar to those of natural fish of the same species may improve performance and reduce adverse ecological interactions.
- [85](#) "Fish are released at a time, size, location, and in a manner that achieves the harvest goals established for the stock. "
- [86](#) "Volitionally releasing smolts during the natural outmigration timing may improve homing, survival, and reduce adverse ecological interactions."
- [88](#) Releasing fish in a manner that simulates natural seasonal migratory patterns improves the likelihood that harvest and conservation goals will be met and may reduce potential adverse ecological impacts.
- [94](#) Releasing fish within the historic range of that stock increases the likelihood that habitat conditions will support the type of fish being released and does not pose new risks of adverse ecological interactions with other stocks.
- [97](#) Conducting a pre-release fish health examination as defined in the PNFHPC guidelines allows for therapeutic treatment prior to release and reduces the risk of dissemination or amplification of fish pathogens in the watershed.
- [98](#) Following IHOT and PNFHPC guidelines for health inspections and notification reduces the risk of dissemination of fish pathogens if fish are transferred between basins.
- [102](#) Using marking/tagging techniques that allow for distinguishing fish by non-lethal means may allow selective fisheries for hatchery fish to occur.
- [93](#) Taking the carrying capacity of the subbasin into consideration when sizing the hatchery program increases the likelihood that stock productivity will be high and may limit the limit the risk of adverse ecological and harvest interactions.
- [69f](#) "IF 1112a-f are all YES:""Producing fish that are qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, and health, may improve performance."""
- [103b](#) no benefit statement available

Listed below are the hatchery practices that might place program goals at risk. ▲
 For further explanation, click the number to the left of the statement.

- [69a](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69b](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance."
- [69c](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."

- [69d](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69e](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [103b](#) no risk statement available

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

- [89](#) Not enough information provided to draw a conclusion.

Release as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [84](#) Releasing fish at sizes and life history stages similar to those of natural fish of the same species may improve performance and reduce adverse ecological interactions.
- [102](#) Using marking/tagging techniques that allow for distinguishing fish by non-lethal means prevents the need to increase mortality solely to identify the fish.
- [101](#) Marking 100% of the hatchery population allows them to be distinguished from the natural population and prevents the masking of the status of that population and prevent overharvest of weaker stocks.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [69a](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69b](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance."
- [69d](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Release as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [84](#) Releasing fish at sizes and life history stages similar to those of natural fish of the same species may improve performance and reduce adverse ecological interactions.
- [85](#) "Fish are released at a time, size, location, and in a manner that achieves the harvest goals established for the stock. "
- [86](#) "Volitionally releasing smolts during the natural outmigration timing may improve homing, survival, and reduce adverse ecological interactions."
- [88](#) Releasing fish in a manner that simulates natural seasonal migratory patterns improves the likelihood that harvest and conservation goals will be met and may reduce potential adverse ecological impacts.
- [94](#) Releasing fish within the historic range of that stock increases the likelihood that habitat conditions will support the type of fish being released and does not pose new risks of adverse ecological interactions with other stocks.
- [97](#) Conducting a pre-release fish health examination as defined in the PNFHPC guidelines allows for therapeutic treatment prior to release and reduces the risk of dissemination or amplification of fish pathogens in the watershed.
- [98](#) Following IHOT and PNFHPC guidelines for health inspections and notification reduces the risk of dissemination of fish pathogens if fish are transferred between basins.
- [99](#) Following IHOT guidelines for fish transport reduces stress and increases the likelihood that the condition of the fish will not be compromised during transport.
- [102](#) Using marking/tagging techniques that allow for distinguishing fish by non-lethal means prevents the need to increase mortality solely to identify the fish.
- [93](#) Taking the carrying capacity of the subbasin into consideration when sizing the hatchery program increases the likelihood that stock productivity will be high and may limit the limit the risk of adverse ecological and harvest interactions.
- [69f](#) "IF 1112a-f are all YES:""Producing fish that are qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, and health, may improve performance."""

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [69a](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69b](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance."
- [69c](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69d](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69e](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

- [89](#) Not enough information provided to draw a conclusion.

Release as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [84](#) Releasing fish at sizes and life history stages similar to those of natural fish of the same species may improve performance and reduce adverse ecological interactions.
- [86](#) "Volitionally releasing smolts during the natural outmigration timing may improve homing, survival, and reduce adverse ecological interactions."
- [88](#) Releasing fish in a manner that simulates natural seasonal migratory patterns improves the likelihood that harvest and conservation goals will be met and may reduce potential adverse ecological impacts.
- [94](#) Releasing fish within the historic range of that stock increases the likelihood that habitat conditions will support the type of fish being released and does not pose new risks of adverse ecological interactions with other stocks.
- [96](#) Releasing fish in the same subbasin as the rearing facility reduces the risk of dissemination of fish pathogens to the receiving watershed.
- [97](#) Conducting a pre-release fish health examination as defined in the PNFHPC guidelines allows for therapeutic treatment prior to release and reduces the risk of dissemination or amplification of fish pathogens in the watershed.
- [98](#) Following IHOT and PNFHPC guidelines for health inspections and notification reduces the risk of dissemination of fish pathogens if fish are transferred between basins.
- [93](#) Taking the carrying capacity of the subbasin into consideration when sizing the hatchery program increases the likelihood that stock productivity will be high and may limit the limit the risk of adverse ecological and harvest interactions.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [69a](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69c](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69d](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
- [69e](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Release as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [95](#) Releasing fish at times of the year and sizes to allow adoption of multiple life history strategies improves the diversity of the stock.
- [102](#) Using marking/tagging techniques that allow for distinguishing fish by non-lethal means prevents the need to increase mortality solely to identify the fish.
- [93](#) Taking the carrying capacity of the subbasin into consideration when sizing the hatchery program increases the likelihood that stock productivity will be high and may limit the limit the risk of adverse ecological and harvest interactions.
- [101](#) Marking 100% of the hatchery population allows them to be distinguished from the natural population and prevents the masking of the status of that population and prevent overharvest of weaker stocks.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [69c](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Release as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [85](#) "Fish are released at a time, size, location, and in a manner that achieves the harvest goals established for the stock. "
- [102](#) Using marking/tagging techniques that allow for distinguishing fish by non-lethal means may allow selective fisheries for hatchery fish to occur.
- [93](#) Taking the carrying capacity of the subbasin into consideration when sizing the hatchery program increases the likelihood that stock productivity will be high and may limit the limit the risk of adverse ecological and harvest interactions.
- [101](#) Marking 100% of the hatchery population allows them to be distinguished from the natural population and prevents the masking of the status of that population and prevent overharvest of weaker stocks.
- [103b](#) no benefit statement available

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Release as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [96](#) Releasing fish in the same subbasin as the rearing facility reduces the risk of dissemination of fish pathogens to the receiving watershed.
- [103a](#) Distribution of hatchery adults by staff may improve the ecological function of the subbasin through nutrient enhancement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Release as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook-Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [84](#) Releasing fish at sizes and life history stages similar to those of natural fish of the same species may improve performance and reduce adverse ecological interactions.
 - [86](#) "Volitionally releasing smolts during the natural outmigration timing may improve homing, survival, and reduce adverse ecological interactions."
 - [88](#) Releasing fish in a manner that simulates natural seasonal migratory patterns improves the likelihood that harvest and conservation goals will be met and may reduce potential adverse ecological impacts.
 - [92](#) no benefit statement available
 - [97](#) Conducting a pre-release fish health examination as defined in the PNFHPC guidelines allows for therapeutic treatment prior to release and reduces the risk of dissemination or amplification of fish pathogens in the watershed.
 - [98](#) Following IHOT and PNFHPC guidelines for health inspections and notification reduces the risk of dissemination of fish pathogens if fish are transferred between basins.
 - [99](#) Following IHOT guidelines for fish transport reduces stress and increases the likelihood that the condition of the fish will not be compromised during transport.
 - [100](#) Use of marking/tagging techniques to distinguish among segments of the hatchery population allows for evaluation of the program's performance.
 - [101](#) Marking 100% of the hatchery population allows them to be distinguished from the natural population and prevents the masking of the status of that population and prevent overharvest of weaker stocks.
 - [69f](#) "IF 1112a-f are all YES:""Producing fish that are qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, and health, may improve performance."""
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

- [69a](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
 - [69b](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance."
 - [69c](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
 - [69d](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
 - [69e](#) "Producing fish that are not qualitatively similar to natural fish in size, growth rate, morphology, behavior, physiological status, or health, may adversely affect performance and increase adverse ecological interactions."
-

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

- [89](#) Not enough information provided to draw a conclusion.
-

Facilities as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [78](#) Siting the facility where it is not susceptible to flooding decreases the likelihood of catastrophic loss.
 - [79](#) "Notification to staff of emergency situations using alarms, autodialers, and pagers reduces the likelihood of catastrophic loss."
 - [80](#) Continuous facility staffing reduces the likelihood of catastrophic loss.
-

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [78](#) Siting the facility where it is not susceptible to flooding decreases the likelihood of catastrophic loss.
- [79](#) "Notification to staff of emergency situations using alarms, autodialers, and pagers reduces the likelihood of catastrophic loss."
- [80](#) Continuous facility staffing reduces the likelihood of catastrophic loss.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[83](#) Hatchery structures provide adult and juvenile passage and prevent impingement or entrapment of migrating or rearing juveniles.

[15a](#) Compliance with NDPES discharge limitations maintain water quality in downstream receiving habitat

[15b](#) Compliance with NDPES discharge limitations maintain water quality in downstream receiving habitat

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[81](#) Failure to implement a riparian management plan poses a risk to water quality and riparian vegetation in the vicinity of the hatchery

[82](#) Failure to Implement an on or off-site mitigation plan does not off-set habitat alteration from hatchery construction and operation.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Facilities as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[15a](#) Compliance with NDPES discharge limitations maintain water quality in downstream receiving habitat

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Harvest for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [24](#) "This program has a numerical goal for total catch in all fisheries, which makes it possible to evaluate its success and implement information responsive management. "

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Biological Significance for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[104c](#) no benefit statement available

[107d](#) no benefit statement available

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[104a](#) no risk statement available

[104b](#) Maintaining a natural spawning population composed of greater than 5% hatchery fish increases the risk of loss of among population diversity.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Survival for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [27](#) "This program has an explicit goal smolt to adult survival, which makes it possible to evaluate success and implement information responsive

management. "

[29a](#) no benefit statement available

[104c](#) no benefit statement available

[107d](#) no benefit statement available

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[104a](#) no risk statement available

[104b](#) Maintaining a natural spawning population composed of greater than 5% hatchery fish increases the risk of loss of among population diversity.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Ecological Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Genetic Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Harvest Interactions for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Environment for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Effectiveness Monitoring as it affects Implementation Monitoring for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

- [24](#) "This program has a numerical goal for total catch in all fisheries, which makes it possible to evaluate its success and implement information responsive management. "
- [27](#) "This program has an explicit goal smolt to adult survival, which makes it possible to evaluate success and implement information responsive management. "
- [30](#) Goals for this program are documented in the following reports: [enter sources]
- [31](#) Results of the evaluation for this program are reported in the following documents: [enter sources]

[29a](#) no benefit statement available

[104c](#) no benefit statement available

[105a](#) Percent hatchery fish spawning in the wild is estimated by annual stream surveys (e.g. carcasses). Accurate estimation of the proportion of hatchery fish spawning in the wild makes it possible to determine whether composition targets are met and it prevents the hatchery returns from masking the status of the natural population.

[105b](#) Percent hatchery fish spawning in the wild is estimated by escapement data from a weir or dam. Accurate estimation of the proportion of hatchery fish spawning in the wild makes it possible to determine whether composition targets are met and it prevents the hatchery returns from masking the status of the natural population.

[107a](#) Percent wild fish used as broodstock is estimated based on external marks. Accurate estimation of wild fish used as broodstock makes it possible to determine whether composition targets are met.

[107b](#) Percent wild fish used as broodstock is estimated based on external marks. Accurate estimation of wild fish used as broodstock makes it possible to determine whether composition targets are met.

Listed below are the hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[104a](#) no risk statement available

[104b](#) Maintaining a natural spawning population composed of greater than 5% hatchery fish increases the risk of loss of among population diversity.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Education for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[120](#) The hatchery facility is open to the public during hours of operation.

[121](#) Hatchery operations are visible to facility visitors.

[122](#) "Hatchery operations (egg take, incubation, rearing) are demonstrated to the public."

[123](#) The facility has adult holding facilities that are open to the public.

[124](#) "The hatchery has signage describing the facility, fish production goals, ties to management goals, ecosystem function."

[125](#) The hatchery has a visible link to the riparian zone for visitors.

[127](#) The hatchery schedules tours for visiting groups.

[128](#) The hatchery provides opportunities for student interns.

[129](#) The program provides opportunities for citizen volunteer involvement.

[130](#) The agency maintains a web page describing the hatchery program.

[131](#) A pamphlet or brochure describing agency or hatchery programs is available.

[133](#) The hatchery staff is involved in community/volunteer meetings or outreach programs.

[134](#) Hatchery staff regularly gives classroom presentations

[135](#) The hatchery staff participates in formal professional presentations or seminars.

[136](#) " The facility is used and/or staff participates in agency, university, or other research projects."

[137](#) Data and information pertaining to the program is accessible to interested parties.

Listed below are hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

Accountability for Deschutes Warm Springs Spring Chinook- Integrated.

Program Type: Integrated

Program Purpose: Harvest, Conservation/recovery, Research and/or education

Mitigation for: Habitat loss

Listed below are hatchery practices that contribute to meeting program goals. ▲

For further explanation, click the number to the left of the statement.

[108](#) no benefit statement available

[109](#) no benefit statement available

[110](#) no benefit statement available

[112](#) no benefit statement available

[113](#) no benefit statement available

[115](#) no benefit statement available

[111](#) no benefit statement available

[117](#) no benefit statement available

Listed below are hatchery practices that might place program goals at risk. ▲

For further explanation, click the number to the left of the statement.

[119](#) The program is constrained by state or federal laws that may inhibit its ability to meet harvest or conservation goals.

Listed below are responses that did not provide enough information to draw a conclusion. ▲

For further explanation, click the number to the left of the statement.

[114](#) Not enough information provided to draw a conclusion.
