

## Aquatic Species Status and Diversity Assessments

### *Introduction*

The Nez Perce and Clearwater National Forests contain some of the most significant and valuable fishery resources in the region, with an estimated 4,330 miles of stream supporting fish within their boundaries. Several of the westslope cutthroat trout streams like Kelly Creek and Cayuse Creek are nationally renowned fisheries. Both Forests are noted for providing a substantial amount of high quality spawning and rearing habitats for a variety of salmonid species especially steelhead trout, Chinook salmon, and bull trout. In addition to harvest species, both forests provide spawning and rearing habitat to non game fish such as Pacific lamprey.

There are 27 known fish species (both native and non-native) inhabiting streams and lakes within the Clearwater and Nez Perce National Forests ([Nez Perce NF species list](#)). Non-native fish game species such as rainbow and brook trout were stocked in lakes and streams and persist today. Other fish species of interest are the white sturgeon and smallmouth bass found in the Salmon River; and sockeye salmon migrate by the Nez Perce National Forest on their way to the headwaters of the Salmon River. In addition to fish species, several amphibian species can also be found within streamside areas and wetlands. Amphibian species considered sensitive or special interest include Coeur d'Alene salamander, Western toad, spotted frog, and Northern leopard frog.

In north-central Idaho's National Forests, the focus of fisheries and fish habitat management, and social and economic interest can be primarily narrowed to four species: steelhead trout, spring Chinook salmon, bull trout, and westslope cutthroat trout. Steelhead trout, Chinook salmon, and westslope cutthroat trout have been traditionally fished for as target species in recreation, commercial, and subsistence fisheries. Pacific lamprey, although not a commercial or recreational harvest species, has cultural significance and its fate is closely tied to salmon and steelhead.

The main threats and risks are reduced fish numbers and habitat quality (see [subwatershed summaries](#)). Main causes of these threats include downstream hydroelectric developments of the Columbia and Snake Rivers, non-native fish introductions, reduced quality of fish spawning and holding water. Hydroelectric development of the Columbia and Snake Rivers and the major tributaries has been costly to anadromous fish resources, mainly Chinook salmon, steelhead trout and Pacific lamprey. Fish destined for Idaho or the ocean had to negotiate eight dams to return to their spawning beds. In 1927 a dam built near Lewiston, Idaho virtually eliminated the run of spring Chinook salmon in the Clearwater drainage. In the early 1970's. Dworshak Dam on the North Fork of the Clearwater River eliminated 60 percent of the Clearwater National Forest's highest quality habitat for steelhead trout.

Non-native fish such as brook trout ([Brook Trout Status Assessment](#)) and bass may have displaced native fish from traditional habitats. Brook, rainbow, and cutthroat trout

stocked in high mountain lakes provide an excellent recreation fishery, with sometimes not-so-good side effects to native fish. Where these stocked fish became established in sufficient numbers, competition for living space and cross-breeding with native fish often occurs.

This situation may be exacerbated where stream sediment and water temperatures have increased. For example, sediment caused by roads, logging, and mining has reduced the quality and quantity of anadromous and resident fish spawning and rearing habitat. Sediment reduces the area in which the adults spawn and poses problems for juvenile fish. It has a major effect on egg and fry survival because it limits water flow and oxygen supply to eggs and inhibits fry escaping from the spawning gravel. Sediment also reduces pool volume (living space) and aquatic food production. Generally speaking, the more sediment in a stream, the fewer the number of fish that stream can support.

### ***Methods***

Status assessment of selected fish species was completed by federal and state fisheries biologists with local working knowledge in the Clearwater and Lower Salmon Basins. Species status was assigned by species to each subwatershed (HUC6) where information was available by subbasin. Species status was determined using the following criteria.<sup>1</sup>

### **Present –Strong: Spawning & Rearing Habitat (code = 111)**

#### **The subwatershed has ALL of the following conditions:**

The species is present in the subwatershed based on sample data using accepted fish sampling methods in the last 10 years; AND

All major life histories (e.g., stream resident or migratory) that historically occurred in the subwatershed are still present; AND

Numbers are stable or increasing, and the local population is likely to be half or more of its historic size or density; AND

The population or metapopulation in the subwatershed, or in the larger region of which it is part, likely is at least 5,000 individuals or 500 adults. If the population size is based on a population that extends outside of this subwatershed, the subwatershed presently constitutes an important core area for this larger population.

Note: # of individuals and/or adults may need revision based on population characteristics or species that do not occur within the interior Columbia River basin

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<sup>1</sup> Region 1 Salmonids Status Assessment (Version 10, –8/10/04).

**Present- Depressed: Spawning and Rearing Habitat (code = 112)**

The species is present in the subwatershed based on sample data using accepted fish sampling methods in the last 10 years; AND the subwatershed has ONE or MORE of the following conditions:

A major life-history component (e.g. migratory or resident form of cutthroat trout) has been eliminated; OR

Numbers are declining, or species occurs in less than half of its historic habitat, or numbers are less than half of historic; OR

Note: If historic habitat is unavailable, densities are less than half of comparable undamaged streams where the species is well-distributed. Hybridized cutthroat issues would be described and displayed in Status of westslope cutthroat trout (*Oncorhynchus clarki lewisi*) in the United States. 2002. (Shepard et al 2002).

The population or metapopulation in the subwatershed, or in the larger region of which it is part, is less than 5,000 individuals or 500 adults (fish in the watershed are isolated by distance or natural barriers from other populations that would collectively exceed these numbers).

Note: Number of individuals and/or adults may need revision based on population characteristics or species that do not occur within the interior Columbia River basin.

**Present- Small & Stable Population: Spawning and Rearing Habitat (code = 113)**

The subwatershed has the following conditions:

The species is known to be present in this subwatershed

The species is using spawning and rearing habitat in this subwatershed

The population in this subwatershed is small (number of individuals in population is less than 500) and the population is believed to be relatively stable and comparable to historic size.

Notes regarding this call:

Small populations that are reduced in size from historic are coded as depressed.

In general these are physically isolated populations or populations that occupy relatively small amounts of habitat.

**Present- Unknown Pop Status: Spawning and Rearing Habitat (code = 119)**

The subwatershed has the following conditions:

The species is present in the subwatershed based on sample data using accepted fish sampling methods in the last 10 years; AND

Sampling has not been conducted at the level to characterize the status of the population.

**Present – Migratory Corridor (code = 120)**

The subwatershed has the following conditions:

The species is known to be present in this subwatershed  
The species uses habitat in this subwatershed for migration

Notes regarding this call:

Migratory corridors are habitat that do not support spawning or rearing and function solely as routes for migrating fish.

In general these areas are main stem rivers contained within composite subwatersheds that do not contain any other spawning and rearing habitat for this species in the tributaries.

This call is not used for resident populations except for adfluvial fish (stream reaches between lakes and spawning areas) and for anadromous fish (although it is recognized that there is some juvenile rearing that occurs in these corridors).

**Absent based on rigorous sampling (code = 210)**

The subwatershed has the following conditions:

Sampling for this species in this subwatershed has been completed using recognized protocol for detecting small, sporadic fish presence (Must have used AFS Western Division protocol for bull trout).

Notes regarding this call:

This protocol does not need to be applied for introduced fishes.  
For introduced fishes the species has not been detected in the subwatershed based on sample data using accepted fish sampling methods in the last 10 years.

**Absent – Historically and Currently Inaccessible or Unsuitable (code = 220)**

The subwatershed has the following conditions:

This subwatershed (or all suitable habitat for the species in this subwatershed) has been inaccessible or is unsuitable to this species since the last ice age, and remains currently so.

Notes regarding this call:

This call is not used to represent temporary or small barriers to the species.

A determination of unsuitable habitat in this call is generally used for anadromous species.

**Presence Unknown – Suitable Habitat Present and Connected (code = 311)**

The subwatershed has the following conditions:

The species has not been detected in this subwatershed

Rigorous sampling protocols have not been implemented to determine the presence of the species.

The subwatershed contains suitable habitat that is physically connected to areas outside the subwatershed that contain the species.

**Presence Unknown – Suitable Habitat Present but Unconnected (code = 312)**

The subwatershed has the following conditions:

The species has not been detected in this subwatershed

Rigorous sampling protocols have not been implemented to determine the presence of the species.

The subwatershed contains suitable habitat that is not physically connected to areas outside the subwatershed that contain the species.

**Presence Unknown – Suitable Habitat Not Present (code = 320)**

The subwatershed has the following conditions:

The species has not been detected in this subwatershed.

Rigorous sampling protocols have not been implemented to determine the presence of the species.

The subwatershed does not contain suitable habitat.

**Assumed Extirpated: Known Historical Habitat (code = 400)**

**The subwatershed has ALL of the following conditions:**

The species has been historically detected or assumed to be historically present based on environmental parameters in this subwatershed.

Assumed that the species no longer occurs in subwatershed.

**Presence Unknown – Habitat Unknown (code = 999)**

The subwatershed has the following conditions:

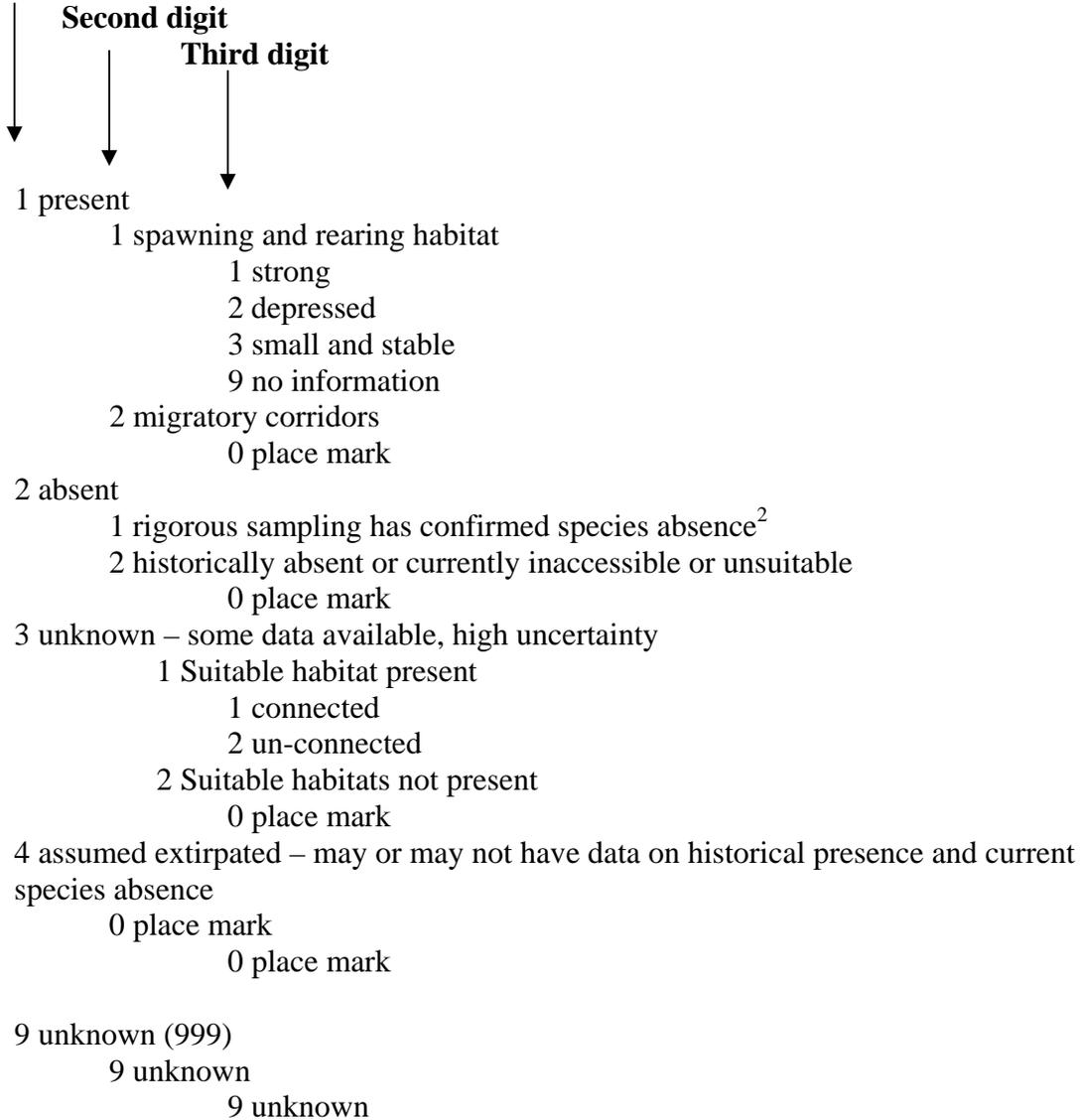
The species has not been detected in this subwatershed

Rigorous sampling protocols have not been implemented to determine the presence of the species.

Habitat conditions in this subwatershed are unknown.

Each of the three digits in salmonids status assessment numerical code represents presence or absence, habitat, species status, or unknown (e.g. 113 = species present – spawning and rearing habitat – small and stable population). This code structure is intended to for use in a database that could be queried to identify occupied, unoccupied, and potential habitat. Under those separate headings you could then query further but you could not query on the second or third digits independently of the previous digits and get any meaningful results.

**First digit – Presence, absence, or unknown**



**Results**

**Chinook salmon** numbers are extremely depressed within the Clearwater and Nez Perce National Forests. Snake River spring Chinook salmon (stream and ocean types) were

<sup>2</sup> Must have used Western Division AFS protocols for bull trout.

listed as threatened under the Endangered Species Act in 1992. Spring chinook salmon in the Clearwater River were exempted from the listing because of uncertainty associated with the genetic integrity of this stock. Genetic integrity was questioned because the construction of Lewiston Dam in 1927 allegedly eliminated all runs of native spring Chinook salmon into the Clearwater basin, and those currently found in the basin are exclusively of hatchery origin. **Fall Chinook salmon** (threatened) are present in the main Clearwater River below the confluence of Lolo Creek and in the Lower Salmon River. It is believed that large numbers of spring and fall Chinook salmon historically occupied all the main tributaries of the Clearwater and Snake Rivers within the two national forests. Current Chinook salmon status by subwatershed is displayed in [table 1](#) and [Chinook salmon](#) status assessment.

Seven areas within the forests boundaries are considered to contain the highest number of returning adults and high quality habitats. These identified strongholds are 1) Lolo and Clear Creeks in the Middle Fork Clearwater River drainage; 2) Brushy Fork, Crooked Fork, Legendary Bear and Colt Killed Creeks in the Lochsa River drainage; 3) American, Crooked, and Red Rivers in the South Fork Clearwater River drainage; 4) entire Selway River and its major tributaries; 5) Slate and White Bird Creeks in the Lower Salmon River drainage; 6) Rapid River in the Little Salmon River drainage; and 7) Bargamin Creek in the Middle Salmon drainage. Remaining populations within the Forests are considered depressed and greatly reduced from historic abundance ([Table 1](#)).

The Interior Columbia Basin Technical Recovery Team identified Chinook salmon populations based on genetics, spawning distribution, life history demographics, and habitat use. Three of these populations occur in the Salmon River portion of the Nez Perce National Forest – Little Salmon River, South Fork Salmon River, and Chamberlain Creek. These defined subpopulations are believed to have connectivity and therefore provide the extent for effects analysis for ESA listed Chinook salmon.

**Steelhead trout, bull trout, and westslope cutthroat trout** distribution in streams on the two Forests is similar to the historic distribution, with the exception that ocean-going steelhead trout no longer exist in the North Fork Clearwater River upstream of the Dworshak Dam. Although present in much of their historic range, it is believed that the abundance and resiliency of these three trout species has been significantly reduced from historic conditions as a result of habitat degradation, introduced species, harvest, and migration barriers ([Table 1](#)). Connectivity between populations within the planning zone remains intact, with exceptions such as road crossings where partial or complete barriers may prevent upstream migration.

**Steelhead trout** historical distribution was all 3<sup>rd</sup> order perennial waters below natural migration barriers within Clearwater and Nez Perce National Forests. It is believed that large numbers of steelhead trout historically occupied these main tributaries of the Clearwater and Snake Rivers within the two national forests. Although Federally listed as threatened in 1997, five areas within the forests boundaries are believed to contain strong ocean returns and high quality habitats. These notable strongholds are Fish and Hungry Creeks in the Lochsa drainage; Moose and Meadow Creek in the Selway Drainage;

White Bird Creek and Rapid River. Remaining populations within the Forests are considered depressed or reduced from historic abundance ([Table 1](#), [Steelhead Assessment Summary](#)). The interior redband trout – the resident form of steelhead trout is present in all areas where steelhead trout currently inhabit and above Dworshak dam in the North Fork Clearwater River.

Based on geography (basin topography) and genetic samples the Interior Columbia Basin Technical Recovery Team concluded the Clearwater River and Salmon River includes substantial life-history diversity. They identified six extant populations in the Clearwater basin and two populations in the lower Salmon River. Because of similar life history diversity and proximity of spawning streams, these defined subpopulations are believed to have connectivity and therefore provide the extent for effects analysis.

**Bull trout** are well distributed in cold water stream habitats within the Nez Perce and Clearwater National Forests. However, concern over declines in bull trout numbers throughout their range resulted in a federal listing as threatened in 1998. Bull trout exhibit both resident and migratory life history strategies. Adults can reside in large rivers and lakes, returning to headwater tributaries to spawn. Their offspring may reside in the headwater streams for one to four years before migrating to larger rivers or lakes. Some individuals have adapted to reside their entire life in the headwater streams. Because of the diverse life history, habitat requirements appear to be very specific depending upon stage of development, migratory path and pattern, and time of year. Cold clean water associated with spawning and early rearing appears to be a critical habitat component. Because of this requirement, spawning and rearing locations tend to occur in upper elevations of streams.

The Clearwater and Nez Perce National Forests have identified five main bull trout populations based on genetics, spawning distribution, life history demographics, and habitat use. These subpopulations generally follow subbasin boundaries or a combination of subbasins. These defined subpopulations are believed to have connectivity and therefore provide the extent for effects analysis ([Bull Trout Assessment Summary](#)). In addition, individual subwatersheds were evaluated for bull trout population status within the Clearwater and Nez Perce National Forests ([Table 1](#); [Bull Trout Status Assessment](#)). Five areas within the forests boundaries are believed to contain the best representation of complete life history and the highest quality habitat for bull trout. These noted bull trout strongholds are 1) headwater streams in the Little North Fork and North Fork Clearwater River drainage; 2) headwater streams in the Lochsa River drainage; 3) Moose Creek in the Selway River drainage; 4) Red River in the South Fork Clearwater River drainage; and 5) Rapid River in the Salmon river drainage.

**Westslope cutthroat trout** are well distributed within the Nez Perce and Clearwater National Forests streams and lakes. From a range-wide perspective, the two forests likely contain the largest remaining inter-connected populations. However, less than optimum habitat and non-native fish have reduced the remaining populations' resiliency to human caused and natural disturbance events.

The Clearwater and Nez Perce National Forests have identified six main westslope cutthroat trout populations based on genetics, spawning distribution, life history demographics, and habitat use. These subpopulations generally follow subbasin boundaries or a combination of subbasins ([Nez Perce NF Assessment Summary](#)). These defined subpopulations are believed to be connected and therefore provide the extent for effects analysis. In addition, individual subwatersheds were evaluated for westslope cutthroat trout population status within the Clearwater and Nez Perce National Forests ([Table 1](#); [Westslope cutthroat trout](#) status assessment).

**Pacific lamprey** historical distribution within the Nez Perce and Clearwater National Forests was presumed to be all waters historically occupied by Chinook salmon. Idaho Fish and Game Department has implemented an active presence and absence inventory since 1999. Results of this inventory indicate a shrinking pattern of distribution in the Clearwater River basin since the 1960's. As a result of this and other dam passage data, Idaho Department of Fish and Game lists Pacific lamprey as an endangered species, a native species in danger of extinction throughout all or a significant portion of its Idaho range. Current known distribution is generally limited to main rivers within the Lower Salmon and Clearwater River basins ([Pacific Lamprey Assessment Summary](#)). Main threats and risks to Pacific lamprey are 1) reduced number of returning adults because of downstream dams creating migration barriers to upstream migration; 2) habitat modifications, specifically increased sediment deposition within spawning and nursery streams; and 3) non-native fish predation on ammocoetes.

For the purpose of population effects analysis, the Clearwater and Nez Perce National Forests have identified two main Pacific lamprey populations – the Clearwater River upstream of the confluence of Potlatch River, and Salmon River from Whitebird Creek upstream to Sabe Creek. These defined subpopulations are believed to have connectivity and therefore provide the extent for effects analysis.

**Table 1 – Subwatershed Fish Populations Status Ratings\***

Fish Species	Population Status Ratings (Count of Subwatersheds)					
	Species Present, Pop. Strong	Species Present. Pop. Depressed	Species Historically Absent	Species Extirpated	Present, Pop. Status Unknown	Species Presence Unknown
Steelhead Trout	15	131	21	48	3	3
Chinook Salmon	0	114	41	51	4	12
Bull Trout	7	138	16	0	5	55
Westslope Cutthroat	99	74	9	1	22	16

\* Data compiled by Clearwater and Nez Perce National Forest biologists using definitions adapted from Lee et al (1991).

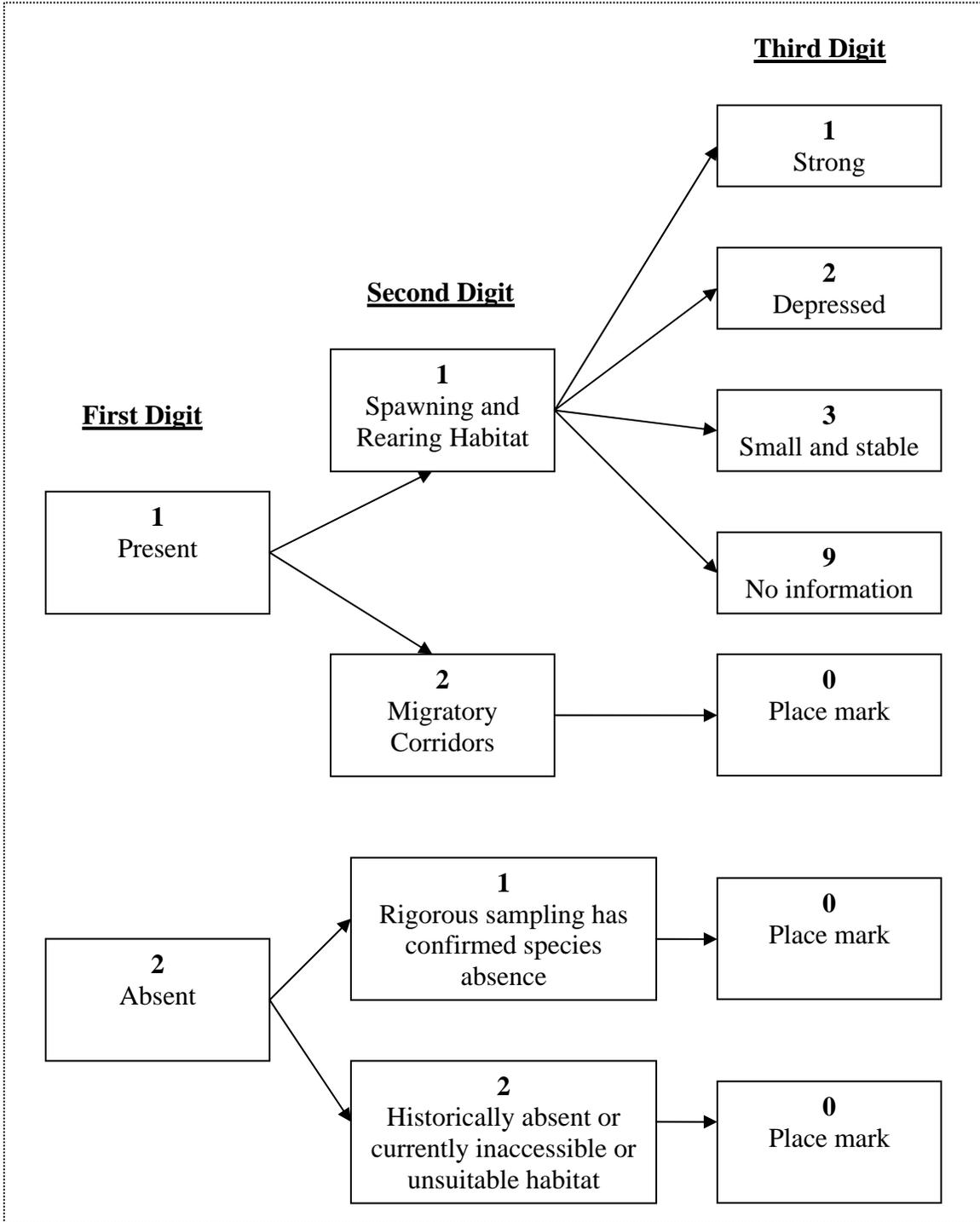


Figure 1. Schematic depicts decision tree for species status classification based upon three digit code formats.

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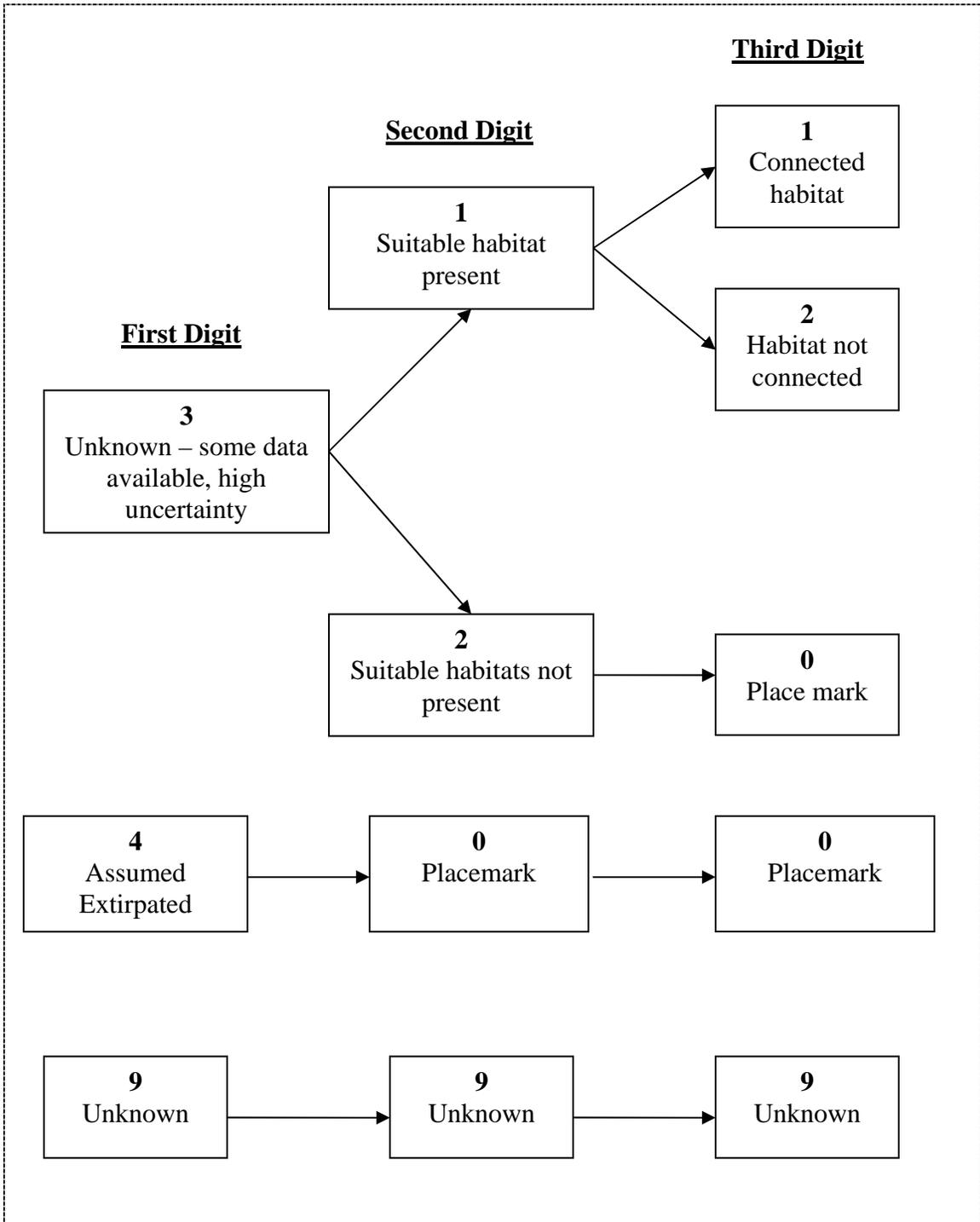


Figure 1. Continued... Schematic depicts decision tree for species status classification based upon three digit code formats.