Odell Lake Bull Trout

Existing Populations

The Odell Lake bull trout population is the one remaining, natural, adfluvial population in Oregon, and is the only population in the Odell Lake Bull Trout SMU (Table 1). Odell Lake was physically isolated from the Deschutes River Basin by a 5,500 year old lava flow which impounded Odell Creek and created Davis Lake (Buchanan et al. 1997).

Table 1. Populations, existence status, and life history of the Odell Lake Bull Trout SMU.

Exists	Population	Description	Life History
Yes	Odell Lake	Odell and Davis lakes and tributaries.	Adfluvial

Distribution

Bull trout currently occupy Odell Lake, Trapper and Odell creeks and two Odell Creek tributaries; Maklaks Creek and an unnamed tributary. Adfluvial bull trout are occasionally reported in Davis Lake and in 2002 one juvenile bull trout was observed in Fire Creek, an Odell Lake tributary (USFWS 2004). Bull trout spawning distribution exists in a 1.3 km reach of Trapper Creek between the mouth and a 2.3 meter barrier waterfall. Historically, Crystal Creek contained the majority of the bull trout spawning distribution; however only kokanee spawn there now (USFWS 2004).

Habitat degradation in Trapper and Crystal creeks is considered a significant threat to spawning bull trout (USFWS 2004). Habitat in Trapper Creek has been significantly altered in the past 70 years through the construction of railroad and road crossings. The removal of wood and riparian vegetation, and the construction of gabions and revetments have resulted in a channelized and over-simplified stream corridor. In 2003 the USFS completed a channel restoration project designed to improve spawning and rearing habitat (USFWS 2004). Crystal Creek spawning habitat is limited due to the contribution of fine sediment and potentially warm water temperatures (USFWS 2004).

Analysis of the distribution criterion is based on 1:100,000 GIS hydrography of bull trout distribution (Hanson 2001, Buchanan et al. 1997). These data are primarily based on summer distribution sampling that often represent the most restricted distribution. A population fails the criterion if spawning and juvenile rearing distribution is: 1) less than ten km, 2) not connected to other populations, or 3) occupies less than 50% of the historic distribution when historical distribution data are available (Table 2).

Table 2. Distribution data used to evaluate Odell Lake bull trout populations.

Population	Spawning Distribution (km)	% of Historical	Connected to Other Pops.	Pass/Fail
Odell Lake	1.3	33	No	Fail

Because Odell Lake is disconnected from the upper Deschutes basin, bull trout in Odell Lake are isolated from other populations. Given Odell Lake bull trout have a very limited spawning distribution, occupy less than 50% of their historical habitat, and are isolated from other bull trout populations, the population fails the distribution criterion (Table 2).

Abundance

Total abundance of Odell Lake bull trout is unknown. Creel surveys, night snorkel counts, trap captures, and redd surveys all suggest the abundance of bull trout is extremely low (USFWS 2004). An average of 15 (range 0 - 30) bull trout were incidentally captured in the kokanee fishery between 1996 and 1999. An average of two adult bull trout (range 0 - 8) and 95 juveniles (range 26 - 208) were counted during annual night snorkel counts in Trapper Creek since 1996. Redd counts in Trapper Creek have never exceeded 16 redds, although redds are difficult to detect due to large substrates, lack of algal growth, and kokanee redd superimposition (USFWS 2004). Challenges associated with each dataset hinder our ability to quantify abundance of the Odell Lake bull trout population.

Based on the previously mentioned datasets, field observations, and professional judgment, the USFWS Odell Lake Bull Trout Recovery Team estimated the abundance of bull trout to be between 20 and 50 adults (USFWS 2004). Populations of bull trout with fewer than 100 spawning adults are considered at risk of inbreeding and fail the interim risk criterion. The sum of interconnected populations also must exceed 1,000 adults to avoid risk of genetic drift (Rieman and Allendorf 2001). Thus an SMU or an isolated population must total greater than 1,000 reproductive adults in order to pass this criterion. Given this estimate, Odell Lake bull trout are considered at risk of the deleterious effects of inbreeding and genetic drift. This population fails the abundance criterion (Table 3).

Table 3. Estimated adult abundance of Odell Lake bull trout populations based on USFWS 2004.

Population	Estimated Adult Abundance	Pass/Fail
Odell Lake	20-50	Fail

Productivity

Data are not available to quantitatively assess productivity of the Odell Lake population, however, the extremely small population size and high variability observed in redd counts and snorkel counts suggests productivity is depressed (USFWS 2004). The presence of non-native salmonids, particularly kokanee, brook trout, and lake trout, negatively impact productivity through redd superimposition, hybridization, competition, and predation. In addition, degraded and limited spawning and rearing habitat in Trapper and Crystal creeks likely limit the population's reproductive capacity. Given these factors, the population fails the productivity criterion.

Reproductive Independence

The Odell Lake bull trout population is native sustained by natural production and passes the reproductive independence criterion.

Hybridization

A population is considered to pass the hybridization criterion if brook trout x bull trout hybrids are rare or non-existent. For most populations the degree of hybridization is not quantified, but professional judgment and the frequency of hybrids encountered during sampling provides a general indication. In cases where little or no information is available and bull trout and brook trout are sympatric, this review assumes hybrids are common.

Brook trout were historically stocked in high elevation mountain lakes in Odell Lake basin including Yoran Lake, the headwaters of Trapper Creek, and Lower Rosary Lake, a tributary to

Odell Creek. Brook trout are currently present in Trapper Creek and are known to hybridize with bull trout (USFWS 2004). Two hybrids were captured in 2004, one in Odell Lake and one on a redd in Trapper Creek (S. Jacobs, ODFW Corvallis Research Lab, personal communication). Although the relative occurrence of bull trout x brook trout hybrids is undocumented, any degree of hybridization is considered a significant impact given the small size of the bull trout population. The Odell Lake population fails the hybridization criterion (Table 4).

Table 4. Occurrence of brook trout and hybridization for Odell Lake bull trout populations.

Population	Brook Trout	Pass/Fail
Odell Lake	Yes	Fail

Assessment Conclusions

The Odell Lake Bull Trout SMU is comprised of one population, the single remaining natural adfluvial population in Oregon. The abundance of the Odell Lake bull trout population is perilously low and spawning habitat is severely limited and of marginal quality. The presence of non-native salmonids, particularly lake trout, brook trout, and kokanee, drastically limit productivity. The Odell Lake SMU meets two of the six interim criteria and is classified as "at risk" (Figure 1). Limited data sets and inferences from other information for populations in this SMU provide a qualified level of confidence in the assessment of interim criteria.

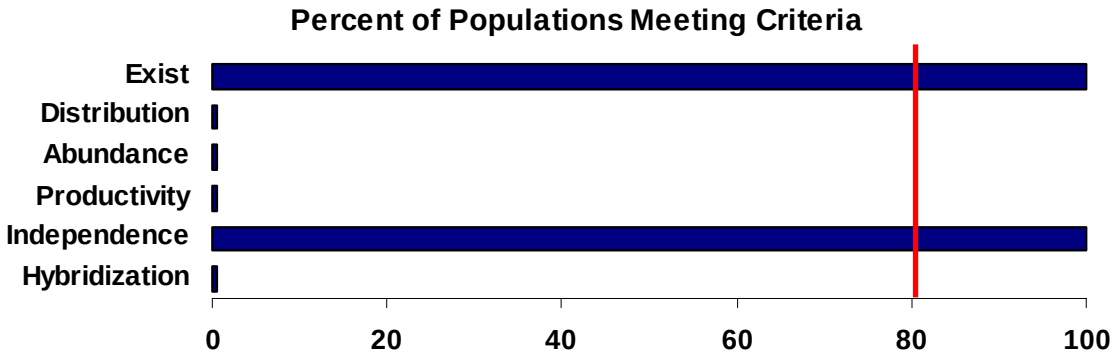

Figure 1. Assessment outcome for each of the six interim criteria with respect to the 80% threshold identified by the NFCP.