ᑐᓂᓯᐅᑦᓯᒃ

ᓄᓇᕗᑦ ᐆᒪᔾᔭᓇᐳᖅᓯᐊᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ

ᐆᒧᖕᖓ

ᑐᑭᓯᐊᕈᑏᑦ: X **ᐃᓱᒪᔭᐊᖏᑦ:**

ᐱᔾᔪᑕᐅᔪᖅ: ᖃᑯᖅᑖᓘᑉ ᓂᕿᐊᓃᑦᑐᑦ ᑐᒃᑐᐃᑦ ᖃᓴᖕᖏᓐᓃᒻᒪᖕᖒᑦ ᖃᐅᔨᓴᕐᓂᖅ, 2012

ᑭᖑᓂᖓᓂᑦ:

ᑐᒃᑐᐃᑦ ᐱᕐᔪᐊᒻᒪᓇᐊᓘᕗᑦ ᐃᓚᒋᓯᐅᔪᓂ ᓄᓇᒥᑦ ᐊᒻᒪ ᐅᑭᐅᖅᑕᖅᑐᒥᑦ ᐆᒪᓂᖅᑲᖅᑐᑦ ᓇᔪᖓᕐᒥᓂᑦ ᐊᑦᑐᐊᖅᑲᑎᒌᓐᓂᖕᖓᓄᑦ. ᐃᓚᖅᑯᓯᑐᖅᑲᒃᑯᑦ ᐊᑐᖅᑕᐅᖏᓐᓇᐅᓯᕐᒪᑕ ᓄᓇᓚᓐᓂ ᓂᕿᒃᓴᓇᓯᐅᑦᓚᓇᒃᑐᑎᓪᓗ. ᓄᓇᐃᑦ ᐃᓚᖏᓐᓂᑦ, ᖃᐅᔨᒪᓂᖅᑕᖅᑎᐊᙳᕆᑦᑐᖅ ᖃᓴᖕᖏᓐᓃᒻᒪᖕᖒᑦ ᓲᖅᑲᐃᒻᒪ ᖃᐅᔨᓴᖅᑎᕐᓱᐊᓄᑦ ᑐᑭᓯᐊᕈᑎᖃᙱᓐᓂᖕᖓᓄᑦ ᐊᔪᕐᓇᓗᐊᕐᓂᖏᓐᓄᑦ ᐊᑐᖅᑕᐅᓯᓇᐊᖅᑲᕋᓯᖅᑐᓂᑦ ᐅᖓᓯᓐᓂᖏᓐᓄᓪᓗ. ᑕᒪᓐᓇ ᓱᓕᑦᑎᐊᒪᓇᒃᑐᖅ ᖃᑯᖅᑖᓗᖑᒍᑦ, ᐱᖓᓱᓂᑦ ᐊᕙᑦᑐᖅᓯᒪᔪᓂᑦ ᑐᒃᑐᕐᑯᑎᖅᑲᒪ ᓇᓚᐅᑦᑖᖅᑕᐅᓯᒪᓂᒃᑯᑦ, ᖃᓴᖕᖏᓐᓃᒻᒪᖕᖒᑦ ᖃᐅᔨᒪᔪᖅᑲᓗᐊᙱᓪᒪᑦ ᖃᓄᐃᓚᐅᓐᓂᓇᕝᑕᖏᓪᓗ (ᕗᖓᓴᓐ ᐊᒻᒪ ᒌᑎᐊᐃ 1992). 60-ᓂᑦ ᐊᕐᕌᒍᓂᑦ ᐊᑑᓯᖅᑐᓂᑦ, ᐃᓚᐃᓐᓇᑐᐊᑯᓗᒃ ᓇᒦᓐᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᖕᒪᑕ ᖃᓴᖕᖏᓐᓃᓐᓇᓱᕆᓯᐅᖕᒪᖕᖒᑕᓗ ᓇᓗᓇᐃᖅᓯᒪᔪᖃᓚᐅᖅᓯᒪᖓᓂ.

ᐊᕐᕌᒍᐃᑦ ᕿᓚᓪᓗᑦ ᐅᖓᑖᓄᑦ ᐃᓄᐃᑦ ᓄᓇᓖᓐᓃᙳᖅᓯᒪᔪᑦ ᖃᑯᖅᑖᓘᑉ ᐅᐊᖕᓇᒃᐸᓯᕐᒦᑦᑐᑦ, ᖃᖓᑦᑎᐊᕌᒃᑯᓪᓗ ᖃᑯᖅᑖᓗᖕᒥᐅᓚᒫᓂᑦ, ᐅᖃᖃᑦᑕᖅᓯᒪᓚᕐᒪᑕ ᑐᒃᑐᐃᑦ ᐅᓄᕈᓐᓃᕐᓂᖏᓐᓄᑦ, ᑭᓯᐊᓂ ᓇᓗᓇᐃᖅᓯᔾᔨᑎᓂ ᐱᑕᖃᙱᑦᑐᖅ. ᑲᑎᓪᓗᒋᑦ ᕿᓚᓪᓗ ᓄᓇᓖᑦ, ᑭᒡᒐᖅᑐᐃᔨᑦ ᓄᓇᕗᒻᒥᐅᑦ ᐊᕕᑦᓗᐊᖏᓐᓂᑦ, ᑐᒃᑐᓇᓱᒃᑲᑦᑕᓚᐅᖅᑐᑦ ᐅᕙᓘᓐᓃᑦ ᑐᒃᑐᓇᓱᒃᐸᒃᑐᑦ ᖃᑯᖅᑖᓘᑉ ᑐᒃᑐᖏᓐᓂ. ᐊᑕᐅᑦᑎᒃᑯᑦ, ᓯᓚᐅᑉ ᐊᓯᔾᔨᐸᓪᓕᐊᓂᖓ, ᐃᓚᓕᐅᑎᓗᓂ ᐅᖅᑰᓯᕙᓪᓕᐊᓂᖓ ᖃᓐᓂᖅᑲᑦᑕᕐᓂᖓ ᒪᕐᑯᖅᑲᑦᑕᕐᓂᖓᓗ, ᐅᓯᖃᖕᓂᐊᒐᒃᓴᓕᕆᓂᐅᑦᓯᒃ ᐅᓯᖃᖕᓂᐊᕐᓂᐅᔪᓪᓗ ᐱᐅᙳᕆᑦᑐᒥᑦ ᐊᒃᑐᐃᓂᖅᑲᖅᑎᑦᑎᖕᒪᑕ ᑐᒃᑐᓂᑦ ᐃᓂᖏᓐᓂᓪᓗ.

ᑖᒃᑯᐊ ᐊᑦᑕᕐᓇᖅᑐᑦ ᐱᔾᔪᑎᒋᓪᓗᒋᑦ, ᑐᒃᑐᐃᑦ ᐱᒻᒪᕆᐅᓂᖏᓐᓂᓪᓗ ᓄᓇᓕᐅᔪᓄᑦ, ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᕿᑖᒎᓕᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᑲᓚᐅᕐᒪᑕ 2012ᒥᑦ, ᖃᐅᔨᓇᓱᒃᑐᑎᑦ ᖃᓴᖕᖏᓐᓂᐸᓗᖕᒪᖕᖒᑦ ᑐᒃᑐᐃᑦ ᖃᑯᖅᑖᓘᑉ ᓂᕿᐊᓃᑦᑐᓂᑦ ᐃᑲᔪᖅᑕᐅᓪᓗᑎᑦ ᓄᓇᕗᑦ ᐆᒪᔾᔭᓇᐳᖅᓯᐊᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ ᐊᒻᒪ ᐊᐅᓚᑦᑎᖃᑎᖃᕐᓂᒃᑯᑦ. ᑕᒪᓐᓇ ᓄᓇᐅᔪᖅ ᐊᒥᓲᓂᖅᐹᒥᑦ ᑐᒃᑐᕐᑯᑎᖃᕐᒪᑦ ᖃᑯᖅᑖᓗᖕᒥᑦ. ᑐᒃᑐᐃᑦ ᖃᓴᖕᖏᓐᓃᒻᒪᖕᖒᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᔪᖅ ᖃᑯᖅᑖᓘᑉ ᓂᕿᐊᓃᔪᔪᖅ ᒫᑦᓯ 27ᒥᑦ ᒪᐃ 27ᒧᑦ 2012ᒥᑦ. ᕿᒥᕐᕈᓚᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᖅᑕᖃᓚᐅᖅᑐᖅ ᒪᕐᕈᖕᓂᒃ ᕿᒥᕐᕈᓚᖕᓂᒃ ᐊᑐᖅᑐᑎᒃ. ᖃᐅᔨᓴᖅᑕᐅᓂᖏᑦ ᑐᑭᓕᐊᖅᑎᑕᐅᓚᐅᖅᑐᑦ

ᐅᖓᓱᓐᓂᖅᑲᖅᑐᑎᒃ ᖁᓕᓂᑦ ᑭᓵᒥᑐᓂᑦ (ᐱᔾᔪᑎᒋᓪᓗᒍ ᓄᓇᐅᑉ ᖃᐅᔨᓴᖅᑕᐅᔪᖅ ᐊᖏᓂᖓᓄᑦ), ᐊᕙᑦᑐᖅᑕᐅᓚᐅᖅᑐᑦ, ᐊᒻᒪ ᐋᖅᑭᒃᓱᖅᑕᐅᓪᓗᓂ ᑲᓇᖕᓇᒥ-ᐱᖓᖕᓇᒧᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᒥᑦ. ᑲᑎᓪᓗᒋᑦ, 27,000 ᑭᓵᒥᑕᓂᑦ ᖃᖓᑕᓚᐅᖅᑐᑦ ᐊᒻᒪ 143-ᓂᑦ ᐊᕙᑦᑐᖅᓱᒪᔪᓂᑦ ᑲᑎᖓᔪᓂᑦ ᑐᒃᑐᓂᑦ ᑕᑯᓚᐅᖅᑐᑦ ᑕᓪᓕᒪᖏᓐᓂᒐᔪᓚᐅᖅᑐᑦ ᑐᒃᑐᐃᑦ ᑲᑎᖓᔪᑦ 1000-ᓂᑦ ᑭᓵᒥᑕᓂᑦ ᖃᖓᑕᓪᓗᑎᑦ. ᑐᒃᑐᐃᑦ ᐊᕙᑦᑐᖅᓱᒪᔪᑦ ᐊᒥᓲᓐᓂᖃᓚᐅᖅᑐᑦ ᐊᑐᐊᓱᕐᒥᑦ 1-ᒥᑦ 16-ᓄᑦ ᑐᒃᑐᓂᑦ, ᐃᒪᐃᖓᔾᑐᓂᑦ ᒪᕐᕌᖕᓂᒃ ᐱᖓᓱᓄᑦ 2-3 ᑐᒃᑐᖃᖅᐸᒃᓗᓂ ᐊᕙᑦᑐᖅᓱᒪᔪᓂᑦ ᑲᑎᙵᔪᓂᑦ. ᖃᓱᖕᒋᓐᓂᒻᒪᖕᒌᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓱᒪᔪᖅ ᕿᑭᖅᑖᓘᑉ ᓂᒋᐊᓄᑦ 1,065 ᐊᒻᒪ 2,067 ᐊᑯᓐᓂᖓᓃᑦᑐᑦ (95% CI) ᑐᒃᑐᓂᑦ ᐊᕿᒍᓕᒫᖅᑲᖅᑐᑦ ᐅᖓᑖᓄᓪᓘᓐᓃᑦ ᐅᑭᐅᖑᑎᓪᓗᒍ 2012ᒥᑦ. ᑲᒪᒋᔭᖃᑦᑎᐊᕈᒪᒧᑦ, ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᐃᓚᐅᑎᕐᓯᓚᐅᙱᑦᑐᖅ ᓄᑲᑐᕋᕐᓂᑦ ᐊᒥᓲᓂᖅᓴᐅᖓᔭᖅᑐᑦ ᓇᓚᐅᑦᑖᖅᑕᐅᓱᒪᔪᑦ. ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᐱᔭᕇᖅᑕᐅᓚᐅᕐᒪᑦ ᓄᕋᖅᑕᕐᑲᓚᐅᙱᑎᓪᓗᒍ, ᐊᒥᓱᓇᐊᕐᓂᖏᓐᓂ ᓇᓗᓇᐃᖅᓯᓚᐅᙱᑦᑐᑦ ᑖᓱᒥᖓ ᐱᔾᔪᑎᖃᖅᓗᑎᒃ 2012ᒥᑦ. ᑭᖑᓂᖓᓂ ᖃᓱᐅᓂᖏᑦ 60,000 ᐊᒻᒪ 180,000 ᐊᑯᓐᓂᖏᓐᓃᔪᔪᑦ 1990-ᐄᑦ ᐱᒋᐊᕐᓂᖏᓐᓂ (ᕝᕙᓴᓐ ᐊᒻᒪ ᑑᑎᐊᐃ 1992). ᖃᐅᔨᓴᖅᑕᐅᔪᕙᓃᑦ 2012ᒥᑦ ᑭᒡᓚᖅᑐᐃᔪᖅ >95% ᐳᓴᓐᑎᒥᑦ ᐅᓄᙱᓐᓂᖅᓴᐅᔪᑦ ᐊᕿᒍᐃᑦ 20 ᐊᕆᑎ ᐃᓗᐊᓂ, ᐱᔭᐅᓱᒪᓪᓗᑎᑦ ᓱᕝᕙᓂᐊᓂ ᖃᐅᔨᓴᖅᑕᐅᔪᒥᓂᕐᓂᑦ.

ᖃᐅᔨᓴᕐᓂᖅᑲᖅᑎᓪᓗᑕ, ᑕᒃᓱᖅᓯᐅᓚᐅᖅᑐᒍᑦ ᐊᒻᒪ ᓱᓚᓗᖃᑦᑕᓚᐅᖅᑐᖅ ᖁᐊᐸᑉᐸᓪᓕᐊᔪᒥᑦ ᑕᒪᓐᓇ ᑐᒃᑐᓄᑦ ᓂᕿᒃᓴᖅᓱᐅᕐᓂᕐᒧᑦ ᐊᔪᓕᕈᑕᐅᕈᓪᓚᐃᓚᐅᖅᑐᖅ. ᓱᓕᔫᒃᑯᑦ, ᐃᓐᓇᐃᑦ ᐊᖑᓇᓱᒃᐆᑎᓪᓗ ᓄᓇᓕᖕᒦᙶᖅᑐᑦ ᐅᖅᑲᖅᑕᕐᒪᑕ ᓱᓚᐅᑉ ᐊᓯᔾᔨᑉᐸᓪᓕᐊᓂᖓᓄᑦ ᖁᐊᐸᓪᓕᐊᔪᒥᓪᓗ ᓱᓚᓗᒻᒧᑦ, ᑐᒃᑐᐃᑦ ᑐᕐᑯᔾᔪᑎᒋᕙᒃᑕᖏᑦ ᐃᓚᖏᓐᓂ ᕿᑭᖅᑖᓗᖕᒥᑦ (ᔭᓐᑭᓐᔅ ᐊᒻᒪ ᐊᓪ. 2012).

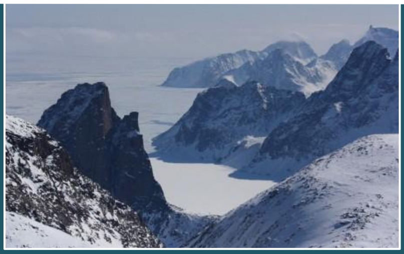
ᑐᒃᑐᐃᑦ ᐱᒻᒪᕆᐅᓪᓚᕆᓐᓂᖏᓐᓄᑦ ᓄᓇᓕᐅᔪᓄᑦ ᐅᑭᐅᖅᑕᖅᑐᒥᓪᓗ ᓂᕐᔪᑎᓂᑦ, ᑕᒪᓐᓇ ᖃᓄᐃᓕᖓᔾᔪᑎᒋᔭᖓ ᕿᓚᒻᒥᐅᔾᔭᒃᑯᑦ ᑐᒃᑐᓂᑦ ᐱᐅᖅᓱᐊᓂᕐᒧᑦ ᐃᓕᓯᓯᒪᔭᕆᐊᓖᑦ ᐱᓕᕆᖃᑎᖏᓐᓂᒃᑯᑦ ᑐᒃᑐᓂᑦ ᑲᒪᓂᖁᑦ ᐸᕐᓇᐅᑎᒥᑦ ᓴᖅᑭᑕᐅᕈᓪᓕᐊᓗᓂ ᓄᓇᕗᒻᒥᑦ ᓄᓇᓕᓐᓂᑦ ᐃᑲᔪᖅᑎᕆᓂᒃᑐᑦ.

ᑐᓴᐅᒪᑎᑦᑎᓂᑦ: 1997-ᒥᑦ, ᐊᒥᓱᓄᑦ-ᐅᑭᐅᓄᑦ ᐸᕐᓇᐅᑎᒥᑦ ᐊᖏᖅᑕᐅᓚᐅᖅᓱᒪᔪᖅ ᑲᑎᒪᑎᑦᑎᖃᑦᑕᓂᕐᒧᑦ ᓴᖅᐹᓗᑎᓗ ᐊᕿᒍᓄᑦ ᖁᓕᓂᑦ ᐊᕆᑎᓄᑦ ᑲᒪᑦᑎᐊᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᓪᓗ ᐸᕐᓇᐅᑎᒥᑦ ᕿᑭᖅᑖᓘᑉ ᓂᒋᐊᓃᑦᑐᓄᑦ ᑐᒃᑐᓄᑦ. 1997-ᒥᑦ 2004-ᒧᑦ ᑲᑎᒪᑎᑦᑎᓃᑦ ᐊᒻᒪ ᑲᒪᑦᑎᐊᓂᕐᒧᑦ ᐸᕐᓇᐃᓂᖅᑕᖅᑲᓚᐅᖅᑐᖅ, ᓱᕝᕙᓪᓕᖅᐹᒥᑦ ᐸᕐᓇᐅᑎᒥᑦ ᓴᖅᐹᓚᐅᖅᑐᑦ ᑭᓱᐊᓂ ᐊᑐᓕᖅᑎᑕᐅᓕᓚᐅᙱᑦᑐᖅ. ᑕᒪᓐᓇ ᒪᓕᑦᑕᐅᓚᐅᕐᒪᑦ ᐃᖅᑲᓇᐃᔭᖅᐱᑦ ᐊᓯᔾᔨᑦᑕᓐᓂᖏᓐᓄᑦ, ᑐᑭᓯᒋᐊᕈᐱᓪᓗ ᐊᒥᓴᓗᐊᕐᓂᖏᓐᓄᑦ ᑐᒃᑐᐃᑦ ᖃᓱᖕᒋᓐᓃᓐᓂᖏᓐᓄᑦ. ᓄᓇᓕᖕᓂᑦ ᑲᑎᒪᖃᑎᖃᒻᒪᕆᖕᓂᒃᑯᑦ 2011-ᒥᑦ ᐊᒻᒪ 2012-ᒥᑦ ᑐᒃᑐᐃᑦ ᐅᓄᕈᓐᓃᓐᓂᖏᓐᓄᑦ ᐊᒻᒪ ᐊᖑᓇᓱᒃᐱᑦ ᐊᒃᓱᕈᖅᑕᑦᑕᕐᓂᖏᓐᓄᑦ ᑐᒃᑐᓯᐅᖅᑎᓪᓗᒋᑦ ᑐᒃᑐᓕᐊᕐᕙᐅᔪᑐᖄᓗᖕᓂᑦ. ᐃᑲᔪᖅᓱᖅᑕᐅᔪᒻᒪᓂᐅᓚᐅᖅᑐᑦ ᑐᒃᑐᓂᑦ ᖃᐅᔨᓴᖅᑎᓪᓗᒋᑦ ᕿᑭᖅᑖᓗᖕᒥᑦ.

ᖃᐅᔨᕓᓚᐅᖅᑐᑦ:

- 2012-ᒥᑦ ᖃᐅᔨᓴᖅᑕᐅᓚᐅᖅᑐᑦ ᐊᔾᔨᒌᓚᐅᖅᑕᕐᒋᑦ ᓄᓇᓕᓐᓂᙵᖅᑐᑦ ᐊᖑᓇᓱᒃᑏᓪᓗ ᐅᖃᐸᑉᑕᕐᒋᓐᓂ ᐅᑭᐅᒐᓴᕐᓄᑦ ᐊᑐᓵᖅᑐᓂᑦ
- ᑐᒃᑐᐃᑦ ᕿᑭᖅᑖᓘᑉ ᓂᒋᐊᓂ ᐅᓄᙱᑦᑐᒫᓚᐅᓚᐅᓗᐃᑦ
- ᐊᖏᓗᐊᑐᐊᕐᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᓐᓂᕋᓗᐊᖅᐸᑕ ᖁᓕᒥᒎᓕᒃᑯᑦ, ᑐᒃᑐᐃᑦ ᕿᑭᖅᑖᓘᑉ ᓂᒋᐊᓐᑦᑐᑦ ᓱᓕ 5000 ᐅᕐᖓᑖᓐᒃᑲᔦᖅᑐᑦ
- ᐱᐅᖅᓱᐊᓂᕐᒧᑦ ᓴᐳᔾᔨᓂᕐᒧᓪᓗ ᐊᑐᓕᕆᐊᖃᖅᑐᑦ

ᖃᓄᐃᓕᐅᖁᔦᐅᔪᑦ: 2012-ᒥᑦ ᖃᐅᔨᓴᕈᑕᐅᓚᐅᖅᑐᑦ ᓴᖅᑭᑕᐅᓯᒪᓕᖅᑐᑦ ᑐᑭᓯᒋᐊᕈᑎᑦᑎᐊᕙᐅᓪᓗᑎᓪᓗ ᑐᒃᑐᐃᑦ ᖃᔅᓯᕐᒋᓐᓃᒋᐊᒃᓴᕐᒋᓐᓂᑦ ᕿᑭᖅᑖᓘᑉ ᓂᒋᑉᐸᓯᖕᒐᓂ. ᐊᕙᑎᓕᕆᔾᒃᑯᑦ ᐱᓕᕆᓂᖃᒃᑲᓐᓂᖅᑐᑦ ᓄᓇᓕᐅᔪᓂᑦ ᑲᑎᒪᖃᑎᖃᑉᐸᓪᓗᑎᑦ, ᖃᐅᔨᒪᔭᐅᔫᒪᓕᐊᓗᐃᓪᓗ ᕿᑭᖅᑖᓘᑉ ᓂᒋᑉᐸᓯᕐᖓᓐᑦᑐᑦ ᑐᒃᑐᓂᑦ, ᐊᒻᒪ ᓴᖅᑮᓪᓗᑎᑦ ᕿᓚᒻᒥᐅᔫᒃᑯᑦ ᐱᐅᖅᓱᐊᓂᕐᒧᑦ ᐊᑐᓕᕈᓐᓇᖅᑐᓂᑦ ᓴᓇᔭᐅᓗᓂ ᓄᓇᓕᖕᓂᑦ, ᐊᕙᑎᓕᕆᔾᒃᑯᓂᑦ ᐊᒻᒪ ᑲᑐᔾᔨᖃᑎᒋᓂᒃᑯᑦ ᑲᒪᓂᕐᒧᑦ. ᑕᒪᓐᓇ ᐃᓚᖃᕐᒥᔪᖅ ᐋᖅᑭᒃᓱᖅᑕᐅᓗᓂ ᑐᒃᑐᓂᑦ ᐃᓕᓐᓂᐊᕐᓂᕐᒥᑦ/ᑲᑎᒪᓂᕐᒥᑦ, ᓄᓇᓕᓕᒫᓂᑦ ᑐᒃᑐᖓᓱᒃᐸᒃᑐᓂᑦ ᑖᒃᑯᓂᖓ. ᑐᕌᖓᔭᐅᓗᓂ ᐃᓕᓐᓂᐊᕐᓂᕐᒥᑦ/ᑲᑎᒪᓂᕐᒥᑦ ᓴᖅᑮᓂᕐᒥᑦ ᕿᓚᒻᒥᐅᔫᒃᑯᑦ ᐊᑐᓕᕈᓐᓇᖅᑐᓂᑦ ᑐᒃᑐᐃᑦ ᐊᒥᓱᕈᒃᑲᓐᓂᕐᓂᐊᕐᒪᑕ ᐊᒻᒪ ᐅᖓᓯᑦᑐᒧᑦ ᐱᑕᖃᐃᓐᓇᕐᓂᐊᕐᒪᑦ ᕿᑭᖅᑖᓗᖕᒥᑦ. 2014-ᒥᑦ ᖃᔅᓯᖕᒋᓐᓃᒻᒪᖕᒫᑦ ᓇᓚᐅᑦᑖᓂᕐᒧᑦ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᓴᓇᓂᕐᒥᑦ ᕿᑭᖅᑖᓘᑉ ᑐᒃᑐᓕᒫᖕᒋᓐᓄᑦ ᐸᕐᓇᒃᑕᐅᕙᓪᓕᐊᔪᖅ.



ᓇᓚᐅᑦᓵᕐᓂᖅ ᐊᒥᖅᓂᖏᓐᓂᒃ ᕿᕿᖅᑖᓗᒃ ᓂᒋᐊᓂ ᑐᑦᑐᐃᑦ

ᓇᐃᓴᓕᑎᖅᓯᒪᔪᑦ ᐅᓂᒃᑳᑦ

ᑎᐸᕋ ᐊ. ᔭᓐᑮᓐᔅ[1]
ᔭᐃᓖᓐ ᒍᐊᕐᑦᔅ[2]
ᓂᑯᓚᔅ ᓚᑳᒻᑎ[3]

[1] ᕿᕿᖅᑖᓗᒻᒥ ᐆᒪᔪᓕᕆᔨ, ᒥᓂᔅᑕᐅᕝᕕᖓᓂ ᐊᕙᑎᓕᕆᔩᒃᑯᑦ, ᕕᕙᒃᑯᖏᑦ ᓄᓇᕗᑦ
ᑎᑎᖅᑲᒃᑯᕝᕙᐊ 400, ᒥᑦᑎᒪᑕᓕᒃ, ᓄᓇᕗᑦ, X0A 0S0
[2] ᐆᒪᔾᕐᓂᒃ ᖃᐅᔨᓴᖅᑎ, ᒥᓂᕐᑕᐅᕝᕕᖓᓂ ᐊᕙᑎᓕᕆᔩᒃᑯᑦ, ᕕᕙᒃᑯᖏᑦ ᓄᓇᕗᑦ,
ᑎᑎᖅᑲᒃᑯᕝᕙᐊ 400, ᒥᑦᑎᒪᑕᓕᒃ, ᓄᓇᕗᑦ, X0A 0S0
[3] ᐆᒪᕐᑲᑎᒌᓐᓅᖓᔾᔪᑦ ᐆᒪᔪᓕᕆᔨ, ᒥᓂᔅᑕᐅᕝᕕᖓᑦ ᐊᕙᑎᓕᕆᔩᒃᑯᑦ, ᕕᕙᒃᑯᖏᑦ ᓄᓇᕗᑦ
ᑎᑎᖅᑲᒃᑯᕝᕙᐊ XXX, ᐃᒡᓗᓕᒃ, ᓄᓇᕗᑦ, X0A 0L0

ᓇᓗᓇᐃᖅᑕᐅᔪᖅ: ᐅᖃᐅᓯᐅᔪᑦ ᐅᕙᓂ ᐅᓂᒃᑳᓂᒃ ᑕᑯᔅᓴᐅᑎᑦᓯᔪᑦ ᑎᑎᕋᖅᑎᓂᒃ ᕙᕕᒃᑯᖏᓐᓂᒃ ᓄᓇᕗᒻᒥᑦᓴᐃᓇᐅᖏᑦᑐᖅ, ᒥᓂᔅᑕᐅᕝᕕᖓᓂᒃ ᐊᕙᑎᓕᕆᔩᒃᑯᑦ

ᐊᖏᕐᕋᐅᑎᒐᑦᓴᖅ ᑐᓴᕋᑦᓴᖅ

ᑐᓐᖓᕕᒋᑦᓱᒋᑦ ᖃᐅᔨᔭᐅᔪᑦ ᐊᖏᓈᖅᓯᒪᔪᒥᒃ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᒥᒃ. ᐊᐅᓚᓂᖃᖅᑐᒥᒃ ᒫᑦᓯ-ᒥᒃ ᒪᐃ–ᒧᑦ 2012 ᓇᓚᐅᑦᓵᖅᑐᒧᑦ ᐊᒥᓲᓂᖏᑦ ᕿᑭᖅᑖᓗᑉ ᓂᒋᐊᓂ ᑐᑦᑐᐃᑦ 1065 – 2067 ᐊᑯᓐᖓᓐᓃᒋᐊᖏᑦ (95% CI) ᐆᒪᔪᐃᑦ ᐊᕐᕌᒍᓖᑦ ᐊᑕᐅᓯᕐᒥᒃ ᐅᖓᑖᓂᓘᓐᓃᑦ. ᖃᐅᔨᓴᕐᓂᐅᑉ ᐃᓗᐊᓂ, ᖃᐅᔨᓴᖅᓯᒪᔪᒧᑦ 185–ᓂᒃ ᑐᑦᑐᓂᒃ ᑲᑎᒪᐅᖅᑐᓂᒃ; ᑕᑯᑦᓴᐅᑎᑦᓯᑦᓯᑎᒃ 518–ᓂᒃ ᐃᒻᒥᒃᑯᑦ. ᐃᓄᐃᑦ ᖃᐅᔨᒪᓂᖏᑦ ᓄᐊᑦᓯᒍᑕᐅᔪᔪᖅ ᓄᓇᓕᓐᓂᒃ 10–ᓂᒃ ᓇᓗᓇᐃᖅᓯᑦᓯᑎᑦᑕᐅᖅ ᑐᑦᑐᐃᑦ ᐃᓄᐃᓴᓪᓕᓯᒪᑎᐊᖏᑦ ᕿᑭᖅᑖᓗᒻᒥ ᑖᒃᑯᐊᓗ ᑲᑎᑦᓯᑎᒃ ᑕᑯᑦᓴᐅᑎᑦᓯᔫᒃ ᐃᓗᓕᖅᑐᔪᒥᒃ ᐊᐅᓚᑦᓯᓂᖅᑕᖃᓇᐊᖃᓇᐊᖓ ᐱᓗᐊᑦᑕᐃᓕᒪᓂᕐᒧᑦᑐ ᐸᕐᓇᐅᑎᒥᒃ.

ᓇᐃᓪᓕᑎᖅᓯᒪᔪᑦ

ᑐᑦᑐᐃᑦ ᐱᒻᒪᕆᐊᓘᕗᑦ ᐃᓗᓕᕆᔭᐅᓪᓗᑎᒃ ᓄᓇᒧᑦ ᐅᑭᐅᖅᑕᖅᑐᒥᓗ ᐆᒪᖃᑎᖀᑦᑐᓄᑦ; ᐱᖅᑯᓯᖅᑎᒧᑦ ᐊᓚᒃᑲᐃᓐᓂᖃᖅᑐᖅ ᓄᓇᓕᓕᓐᓄᑦ ᐊᒻᒪᓗ ᐱᒻᒪᕆᐊᓘᑦᓯᓂ ᓂᕿᑦᓴᐅᑦᓯᓂ. ᓄᓇᕐᔪᐊᑉ ᑲᔮᖓᓂ ᐅᑭᐅᖅᑕᖅᑐᒥ, ᐃᓄᐃᓴᓪᓕᕚᓪᓕᖅᓯᒪᔪᑦ ᐃᑰᓐᓈᒍᑦ ᑐᑦᑐᐃᑦ ᑕᒪᓐᓇᓗ ᐊᑦᑐᐃᓂᓪᒪᓇᖅᑐᐃᓐᓇᓇᐊᖃᖅᓯᓂ ᐱᖅᑯᓯᑐᖃᖅᑎᒍ2 ᐊᖑᓇᓱᓐᓂᕐᒥᒃ ᐊᑑᑎᔭᐅᓯᒪᔪᓂᒃ ᐊᕐᕌᒍᕋᓴᕐᔪᐊᕌᓗᐃᑦ ᒥᓕᐊᖏᓐᓃᑦᑐᑦ, ᐱᓗᐊᖅᑐᒥᒃ ᐃᓄᓐᓄᑦ. ᐃᓚᖏᓐᓂ ᓄᓇᐃᑦ, ᓱᓕ ᓇᓗᓇᖅᑐᑦ ᑐᑦᑐᖃᑦᑕᕐᓂᖏᑦ ᐊᒥᒐᖅᓯᓂᑯᒧᑦ ᑐᑭᓯᓇᓱᐊᖅᑎᓂᒃ ᑐᓴᕋᑦᓴᓂᒃ ᓱᓇᑐᐃᓐᓇᓇᐃᑦ ᐱᔾᔪᑎᒋᓪᓗᒋ2 ᓇᒥᑐᐃᓐᓈᕐᓂᖏᓪᓗ; ᐱᓗᐊᖅᑐᒥᒃ ᕿᑭᖅᑖᓗᒻᒥ, ᐱᖓᓲᓕᖅᑲᖓᔪᑦ ᑐᑦᑐᖃᕐᕕᐅᔪᑦ ᓇᐹᖅᑐᖃᖕᖏᑦᑐᒥᐅᑕᐃᑦ ᑐᑦᑐᖏᓐᓄᑦ ᒫᓐᓇ ᐃᓕᑕᕆᔭᐅᔪᑦ ᖃᐅᔨᒪᔭᐅᓗᐊᕋᑎᒃ ᖃᑦᓯᐅᓂᖏᑦ ᐊᐅᓚᓂᕆᕙᑦᑕᖏᓪᓗ (ᓲᕐᓗ ᕗᒍᓴᓐ ᐊᒻᒪᓗ ᒑᓚᐊᐃ 1992). ᐊᕐᕌᒍᓂ 60-ᓂ ᐊᓂᒎᖅᑐᓂ, ᒥᑭᔫᑎᐹᓗᐃᑦ ᖃᐅᔨᒪᖅᑕᐅᓯᒪᔪᑦ ᐊᒥᓱᐊᓗᓐᓂᓪᓗ ᓇᓚᐅᑦᓵᖅᑐᓂᒃ ᐱᑕᖃᓚᐅᖅᓯᒪᒐᓂ. ᐊᕐᕌᒍᐃᑦ ᖁᓕᑦ ᐃᓄᐃᑦ ᓄᓇᓖᑦ ᐅᐊᓐᓇᖓᓂ ᕿᑭᖅᑖᓗᑉ, ᐊᒻᒪᓗ ᒫᓐᓇᖃᒻᒥᖅ ᕿᑭᖅᑖᓗᓕᒫᒥ, ᐅᖃᖅᓯᒪᔪᑦ ᐃᓄᐃᓴᓪᓕᓯᒪᑎᐊᖏᑦ ᑐᑦᑐᐃᑦ ᕿᑭᖅᑖᓗᒻᒥ, ᓈᓴᐅᑎᓂᒃ ᐱᑕᖃᓐᖏᒃᑲᓗᐊᖅᑎᓪᓗᒍ. ᐅᕙᓂ ᐅᖃᖅᑐᒍ2 ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᑐᑦᑐᐃᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᖏᑦᑕ ᒫᑦᓯᒥᒃ ᒪᐃ 2012-ᒧᑦ ᕿᑭᖅᑖᓗᑉ ᓂᒋᐊᑕ ᑐᑦᑐᖏᓐᓂ; ᐊᖏᓂᖅᐹᖅ ᐃᓂᒋᔭᐅᔪᖅ ᐱᖓᔪᒋᔭᐅᔪᓄᑦ ᐱᖓᓲᓕᖅᑲᖓᔪᓄᑦ ᕿᑭᖅᑖᓗᒻᒥ, ᓄᓇᕗᑦ. ᑎᑭᑦᓯᒪᔭᐅᔪᖅ ᖃᐅᔨᓴᕐᓂᐅᔪᒥᒃ ᐊᑐᐃᓐᓇᐅᑎᑦᓯᓂᖅ ᓯᕗᓪᓕᖅᐹᒥ ᐃᓗᓕᖅᑐᔪᓂᒃ ᐊᒥᓲᓂᖏᓐᓂᒃ ᒥᑦᓴᐅᓯᔪᓂᒃ ᐊᒻᒪᓗ ᐅᓪᓗᒥᓯᐅᑎᓂᒃ ᖃᐅᔨᒪᓂᐅᔪᓂᒃ ᖃᓄᐃᓕᖓᓪᓕᒫᖓᑕ. ᐊᑐᔪᔪᑦ ᐅᖓᓯᓐᓂᕐᒧᑦ ᖃᐅᔨᓴᕐᐅᑎᓂᒃ ᑐᓐᖓᕕᐅᔪᓂᒃ ᑐᑭᒧᐊᑦᑐᓂᒃ ᓇᓗᓇᐃᒃᑯᑕᖃᖅᓯᑕ ᖃᖓᑕᕕᐅᑦᓯᑎᒃ ᖁᑲᒎᓐᓇᓄᑦ ᒪᕐᕉᓐᓄᑦ. ᖃᐅᔨᓴᕐᓂᐅᔪ2 ᐊᑯᓐᓂᖏᑦ ᐅᖓᓯᒌᓐᓂᖃᖅᓯᑎᒃ 10 ᑭᓗᒦᑕᓂᒃ (ᐱᔾᔪᑕᐅᓪᓗᓂ ᐊᖏᓂᖓ ᖃᐅᔨᓴᖅᑕᐅᔫᑉ), ᐃᒻᒥᒃᑯᐊᖅᑎᖅᑕᐅᓯᑦᑕᕆᕗᑦ ᐊᕕᑦᑐᖅᓯᒪᓂᖏᑦᑎᒍᑦ, ᐃᖏᕐᕋᑦᓯᑎᓪᓗ ᑲᓇᓐᓇᒥᒃ ᐱᖓᓐᓇᒧᑦ ᖃᐅᔨᓴᕐᕕᐅᑉ ᐃᓗᐊᓂ. ᑭᖑᕐᖓᒍᑦ Buckland et al. 2001, ᐊᑯᓐᓂᖏᑦ ᐋᖅᑭᑦᑕᐅᓯᒪᔪᑦ ᓇᓚᒌᑦᑎᑕᐅᒐᓱᐊᖅᓯᑎᒃ, ᓈᒻᒪᓈᖅᓯᒪᔪᓂᒃ ᑕᑭᓂᖃᖅᓯᑎᒃ, ᖃᐅᔨᓴᕐᕕᐅᔪᑦ. ᐃᑰᓐᓈᒍᑦ ᖃᖓᑕᔪᔪᑦ 27000 ᑭᓗᒦᑕᓂᒃ ᑕᑯᑦᓯᑕᓗ 143–ᓂᒃ ᑐᑦᑐᓂᒃ ᑲᑎᒪᐅᖅᑐᓂᒃ ᑕᑯᔭᐅᔪᑦ ᑕᓪᓕᒪᐅᓕᖅᑲᖓᕙᑦᓯᑎᒃ ᐊᑐᓂᑦ 1000 ᑭᓗᒦᑕᓂᒃ ᖃᖓᑕᓂᐅᔪᓄᑦ. ᐊᑐᕐᓂᖅ ᐅᖓᓯᓐᓂᖅ 6–ᒥᒃ, ᓇᓚᐅᑦᓵᖅᓯᒪᔪᒧᑦ ᕿᑭᖅᑖᓗᑉ ᓂᒋᐊᓂ ᑕᑯᔭᐅᔪᑦ ᐊᑯᓐᖓᓐᓃᑦᑐᑦ 1,065 - 2,067 (95% CI))

ᑐᑦᑐᐃᑦ ᐊᕐᕌᒍᓖᑦ ᐊᑕᐅᓯᕐᒥᒃ ᐅᖓᑖᓂᔫᓈᓃᑦ ᒫᑦᓯ–ᒪᐃ 2012. ᓈᒻᒪᓈᕆᐊᖅᓱᒍ, ᕿᒥᕐᕈᓂᖅ ᐱᖃᓱᐅᔾᔮᖏᑦᑐᖅ ᐊᕐᕌᒍᕐᑲᓐᖏᓗᐊᖅᑐᓂᒃ ᐊᒥᓱᓐᖑᐹᓪᓚᑎᑦᓯᕙᔾᔪᔪᑦ ᒥᑦᓴᐅᓯᔾᔪᐊᓂᒃ. ᐊᒻᒪᓗ, ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᐱᔾᓈᖅᑕᐅᔪᔪᖅ ᕿᑐᕐᖏᐅᓐᖏᓗᐊᖅᑎᓪᓗᒋᑦ ᑕᐃᒪᐃᒻᒪᑦ ᓇᓚᐅᑦᓵᖅᑕᐅᖃᓱᐅᑎᔪᓐᖏᑦᑐᑦ ᕿᑐᕐᖏᐅᕈᑕᐅᔪᑦ 2012–ᒥ. ᓯᕗᕐᖓᓂ ᓂᖅᐅᒋᔭᐅᓯᒪᔪᑦ ᐊᒥᓲᓂᖏᓐᓅᖓᔪᑦ ᐊᑯᕐᖓᓐᓂ 60,000 ᐊᒻᒪᓗ 180,0000 31990–ᖏᑦ ᐱᒋᐊᖅᐸᓪᓕᐊᓕᖅᑎᓪᓗᒋᑦ (Ferguson ᐊᒻᒪᓗ Gauthier, 1992 ᑕᑯᓗᒋᑦᑕᐅᖅ Jenkins ᐊᒻᒪᓗ ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᖃᐅᔨᔭᐅᔪᑦ ᑕᑯᑦᓴᐅᑎᑦᓯᔪᑦ >95% ᐊᑉᐸᐹᓪᓕᕐᓂᕐᒥᒃ ᐊᕐᕌᒍᐃᑦ ᐊᖏᑎᑦ ᑕᑯᓐᓇᖅᓱᒋᑦ. ᑕᑯᓐᓇᖅᓱᒋᑦ ᐊᑦᑐᐃᓂᒻᒪᕆᔭᖏᑦ ᑐᑦᑐᐃᑦ ᓄᓇᓕᓕᓐᓂᒃ ᐊᒻᒪᓗ ᐅᑭᐅᖅᑕᖅᑐᒥ ᐆᒪᕐᑲᑎᒌᑦᑐᓂᒃ ᐃᓘᓈᒍᑦ, ᑕᒪᓐᓇ ᖃᓄᐃᓕᖓᓂᐅᔪᖅ ᐱᔭᕆᐊᕐᑲᖅᑎᑦᓯᔪᖅ ᐃᓗᓕᖅᑐᔪᒥᒃ ᐊᐅᓚᑦᓯᕐᑲᑎᒌᓐᓂᕐᒥᒃ ᐱᓗᐊᑦᑕᐃᓕᒪᓂᕐᒍᓪᓗ ᐸᕐᓇᐅᑎᒥᒃ.

ᓇᓗᓇᐃᔭᖅᑕᐅᔪᑦ

ᑮᓇᐅᔭᖃᖅᑎᑕᐅᓯᒪᔪᖅ ᑕᒪᓐᓇ ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᒥᓂᔅᑕᐅᕕᖕᖓᓐᓄᑦ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ, ᒐᕙᒪᒃᑯᖏᓐᓂ ᓄᓇᕗᑦ, ᔫᓚ ᑳᓐᑎᓇᓐᑐ ᓯᐅᑦᑫ ᐊᐅᓚᓂᕐᒧᑦ, ᐊᒻᒪᓗ ᓄᓇᕗᒻᒥ ᐆᒪᔪᓕᕆᔨᕐᔪᐊᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ. ᐃᑲᔪᖅᑕᐅᖃᓯᐅᑎᓯᒪᒻᒥᔪᑦ ᑲᓇᑕᒥ ᐆᒪᔪᓕᕆᔨᒃᑯᓐᓄᑦ, ᓄᓘᔭᓐᓂ ᐅᔭᕋᕐᓂᐊᖅᑎᓄᑦ, ᐊᒻᒪᓗ Peregrine ᑕᐃᒪᓐᓂᐊᖅᑎᓄᑦ. ᖁᔭᓐᓇᒦᒃ ᓄᓇᒥ ᐃᖅᑲᓇᐃᔭᖅᓯᒪᔪᑦ, ᐱᖃᐅᓯᑎᑦᓱᓂ ᑯᓇᔅ ᐅᐊᒃᔅ, ᕕᐊᓐ ᐅᐃᑐᓴᓐ, ᐹᑦ ᐃᑦᓚᐅᑦ, ᐅᕿᑦᑐᖅ ᐊᓰᓈ, ᔭᐃᐴᑎ ᐊᒃᐸᓕᐊᓗᒃ, ᐃᓚᐃᓱᐊ ᑲᓐᖑ, ᒥᓕᓴ ᐊᓕᐊᑦ, ᒍᐃᓚᐅᒻ ᓱᐊᕐ, ᑯᓇᔅᑎ ᓗ, ᔮᓐ ᑖᓂᐅᑦ ᕗᓗᐃᓐ, ᓂᒃ ᕘᓇᕕ, ᓯᐊᕋ Hᐅᑦᔅᒪᓐ, ᐸᑐᓇᔅ ᐸᐃᑕᓂ, ᐱᓗᐊᖅᑐᒥᑦᓗ ᒥᑦᔅ ᑳᒻᒐ ᑲᒪᒋᓚᐅᖅᑕᖕᖓᓄᑦ ᖃᐅᔨᓴᕐᓂᕐᒥ. ᖁᓛᒎᓕᓐᓂᒃ ᖃᖓᑕᔫᖅᑎᕗᑦ ᔪᕋᑦ Hᐊᑐᕆ,ᑎᐅᕆ Hᐊᕝᓚ, ᐊᒻᒪᓗ ᔮᓐ ᐃᓂᔅ ᐊᒻᒪᓗ ᐊᐅᓚᐅᓯᕆᓃᑦ, ᕋᐃᓂᐊ ᑲᒥᖕ, ᑯᓇᔅ ᐅᐊᕐᒐᓐ, ᔭᐃᓴᓐ ᓯᓪᔅ, ᒑᓚᓐ ᐴᔅ, ᐊᒻᒪᓗ ᒫᒃ ᕗᓕ, ᔫᓂᕘᓯᒃᑯᓐᓂ ᖁᓛᒎᓕᒃᑯᑦ, ᖁᔭᓐᓇᒦᐹᓗᒃ. ᖁᔭᓐᓇᒦᕆᐊᓪᓚᒥᔭᕗᑦ ᐹᑦ ᖃᐅᔅᑭ ᐊᐅᓚᑦᓯᓂᖓᓄᑦ ᓄᓇᓕᐅᑲᐃᓐᓇᐸᑦᑐᓂ ᐊᒻᒪᓗ ᓂᕿᑦᓯᐊᕚᓗᓐᓂᒃ ᓂᕆᒃᑲᐃᖃᑦᑕᕐᓂᖓᓄᑦ ᑐᓐᖓᓇᕐᓂᖓᓄᑦᓗ, ᐊᒻᒪᓗ ᓭᒻ ᑖᕗᓗᐊ, ᑲᓇᑕᒥ ᐆᒪᔪᓕᕆᔨᒃᑯᓐᓂᒃ, ᐃᑲᔪᖅᓯᓂᕆᓯᒪᔭᖓᓄᑦ. ᓱᓇᑐᐃᓐᓇᕐᓄᑦ ᐃᑲᔪᖅᓯᒪᓂᖓᓄᑦ ᖁᔭᒋᔭᕗᑦ ᔨᒥ ᓅᕘᑦ, ᐹᑕ Hᐊᐃᑦ, ᐃᐅᑦᑕᓐ ᐅᐃᓕᐊᒻᔅ, ᒍᐃᓚᐅᒥ ᓱᐊᕐ, ᓲᐅ ᐅᑯᒻᒪᖅ, ᑯᓇᔅ ᐅᐊᒃᔅ, ᓴᐊᕗᓇ ᖃᐅᓐᓇᖅ, ᑎᒻ ᑲᐃᑕ, ᒪᓕᒃ ᐊᕙᓐ, ᓂᑯᓚᔅ ᓚᑲᒻᑏ, ᓴᕇᓇ ᑲᓇᑎ, ᒪᐃᒃ ᒥᕝᓕᓐ, ᐱᐊᕆ ᐋᕆᐊᒃ, ᒫᑎᐅᓯ ᐅᓈᓚᒃ, ᐊᐃᒥ ᐊᒻᓚᒃ, ᑕᐃᓚ ᕌᔅ, ᑯᓇᔅᑎ ᓗ, ᐅᐃᓐ ᕚᓂHᐅᑎ, ᓯᑏᕝ ᐋᑦᑭᓐᓴᓐ, ᐊᒻᒪᓗ ᐱᓗᐊᖅᑐᒥᒃ ᒪᓕᔅ ᐊᓕᐊᑦ. ᖁᔭᓐᓇᒦᖅᑕᐹᓗᑎᒻᒥᔭᕗᑦ ᑎᒻ ᒪᒃᑲHᐅᑎ, ᑭᓕᐊᓐ ᐹᓴᓐᔅ, ᐊᒻᒪᓗ ᔫᑎ ᒪᑯᕋᐅ PCSP-ᑯᓐᓂᒃ ᖃᐅᑕᒫᑦ ᓱᓇᑐᐃᓐᓇᕐᓄᑦ ᐃᑲᔪᖅᓯᓂᖓᓄᑦ. ᕿᒥᕐᕈᓂᕐᒧᑦ ᐅᖃᐅᓯᑦᓴᐃᑦ ᐊᑐᐅᓐᓇᐅᑎᑕᐅᔪᑦ ᑎᐅᒍ ᒪᖅᔅ–ᒧᑦ ᐊᒻᒪᓗ ᐃᐅᕆᒃ ᕐᑫᔅᑕᑦ, ᑐᑦᑕᕐᕕᒃ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᓄᓇᒥᒃ ᐊᕙᑎᒥᑦᑐ, ᓯᓚᑦᑐᓴᕐᕕᔾᔪᐊᖓᓂᒃ St. Andrews, ᒫᑎᐅ ᑑᒪᓐ, ᒥᓂᔅᑕᐅᕕᖕᖓᓐᓂᒃ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ, ᒐᕙᒪᒃᑯᖏᓐᓂᒃ ᓄᓇᕗᑦ ᐊᒻᒪᓗ ᓱᐊᕐ ᓱᑕᐃᐳᑕᓐ, ᐃᑲᔪᖅᓯᒪᔪᐃᓐᓇᑦ ᐱᕚᓪᓕᑎᑦᓯᑦᓱᑎᒃ ᐅᑯᓇᓐᖓᑦ ᐅᓂᒃᑳᓂᒃ.

ᐃᓗᓕᖏᑦ

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ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 1b. ᕿᑭᖅᑖᓘᑉ ᓂᒋᐊᓂ ᑐᑦᑐᓂᒃ ᖃᐅᔨᕐᓴᓂᖅ, 2012...**25**

ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 2. ᐊᕕᑦᑐᖅᓯᒪᔪᑦ (ᑕᐃᒫᒃ ᓇᓗᓇᐃᔭᖅᓯᒪᒻᒪᑕ ᐆᒪᔪᓕᕆᓂᕐᒧᑦ ᐱᓕᕆᔨᓄᑦ, 1995) ᐃᓗᐊᓂ ᓂᒋᐊᑕ ᕿᑭᖅᑖᓘᑉ ᖃᐅᔨᕐᓴᕐᕕᐅᑉ (2012)..**26**

ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 3a. ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ ᖃᐅᔨᓴᕐᓂᐅᔪᑦ, ᐊᑯᓐᓂᖓᓂᑦ 10km ᐊᕕᑦᑐᖅᓯᒪᑦᓱᑎᒃ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᔪᓂᒃ **28**

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ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 4. ᖃᐅᔨᓂᐅᑐᐃᓐᓇᖏᐊᓖᑦ (ᑲᔪᓯᔪᒥᒃ ᑐᑭᓕᐊᖅᑐᑦ) ᐅᖓᓯᓐᓂᐅᔪᑦ ᑐᑭᓕᐊᖅᑐᑦ ᑲᑎᒪᐅᖅᑐᓄᑦ ᑐᑦᑐᓄᑦ ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ ᖃᐅᔨᕐᓴᓂᐅᔪᑦ, ᒦᑦᓯ 27 – ᒪᐃ 27, 2012. (x) ᓇᓚᐅᑦᓵᖅᑕᐅᔪᑦ ᐊᑐᖅᓱᑎᒃ ᐊᕝᕙᓪᓗᐊᖏᓐᓂᒃ ᐊᑐᖅᑕᐅᕙᔪᑦᑐᑦ (ᑕᑯᓗᒍ ᑎᑎᕋᕐᕕᒃ 55 ᐊᑖᓂ). ᐊᖏᓂᖓ 165 m **31**

ᑎᑎᕋᖅᓯᒪᔪᑦ ᑎᑎᕋᕐᕕᑦ

ᑎᑎᕋᕐᕕᒃ 1. ᓄᓇ (sq. m) ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐃᒻᒥᒃᑯᐊᖅᓯᒪᔪᓂ ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ ᖃᐅᔨᓴᖅᑕᐅᕝᕕᒃ.....................**27**

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ᑎᑎᕋᕐᕕᒃ 4. ᓇᓗᓇᐃᔭᖅᓯᒪᔪᑦ MCDS ᐊᒻᒪᓗ CDS ᐊᐅᓚᓂᖏᑦ ᐃᓱᒪᑦᓴᖅᓯᐅᕈᑕᐅᔪᑦ ᖃᐅᔨᔭᐅᓂᖏᓐᓄᑦ ᐊᐅᓚᓂᖏᑦᑕ, ᐊᑐᐃᓐᓇᐅᓂᖏᑦᑕᓗ covariates..**32**

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ᑎᑎᕋᕐᕕᒃ 5. ᓇᓚᐅᑦᓵᖅᑕᐅᔪ6 ᑐᑦᑐᖃᕐᓂᐅᔪᑦ ᐊᒥᓲᓂᖏᓪᓗ ᐃᓗᐊᓂ ᓄᓇᐃᑦ 8-ᓂᒃ ᐋᔾᔨᒌᖕᖏᑦᑐᓂᒃ ᖃᐅᔨᓴᕐᕕᐅᔪᓂᒃ ᑐᕋᐃᓐᓇᖅᑐᓂᒃ, ᑐᖕᖓᕕᖃᖅᓱᑎᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐅᖓᓯᑦᑐᒥᒃ 6 ....**33**

1.0 ᐃᓄᓕᖅᑎᑦ

ᓇᐹᖅᑐᕐᑲᓐᖏᑦᑐᒥᐅᑕᐃᑦ ᑐᑦᑐᐃᑦ ᕿᕿᖅᑖᓗᒻᒥ ᓂᕿᑦᔭᐅᓪᓚᕆᑦᑐᑦ ᐊᒻᒪᓗ ᐊᖑᓇᓱᐊᖅᑕᐅᕙᑦᓱᑎᒃ 10–ᓄᑦ ᓄᓇᓕᓐᓄᑦ, ᐱᕐᑲᓱᐅᑎᑦᓱᓂ ᐃᕐᑲᓗᐃᑦ, ᒐᕙᒪᕐᑲᕝᕕᖓᑦ ᓄᓇᕗᑦ. 1990 ᕿᑎᖏᓐᓂᓂᑦ ᐊᖑᓇᓱᑦᑏᑦ ᐊᖑᓇᓱᑦᑎᓄᓪᓗ ᑎᒥᐅᔪᑦ ᐅᕐᑲᕐᑲᑦᑕᖅᓯᒪᔪᑦ ᑐᑦᑐᐃᑦ ᐱᔭᕇᐊᑦᑐᐸᓪᓕᐊᑐᐃᓐᓇᕇᐊᖏᑦ ᓇᐃᐱᒋᐊᖏᑦ ᐃᓄᐃᓴᑦᑑᒋᐊᖏᓪᓗ (Jenkins ᐊᒻᒪᓗ Goortes 2013, Jenkins et al 2012). ᓇᐹᖅᑐᕐᑲᓐᖏᑦᑐᒥᐅᑕᐃᑦ ᑐᑦᑐᐃᑦ ungulate–ᑐᐊᑦ ᓇᔪᒐᕐᑲᖅᓱᑎᒃ ᐱᖓᓲᓕᖅᑲᖓᔪᑦ ᑐᑦᑐᐃᑦ ᒫᓐᓇ ᐃᓕᑕᕇᔭᐅᔪᑦ: ᓂᒋᐊᓂ ᕿᕿᖅᑖᓘᑉ, ᐅᐊᓐᓇᖓᓂ ᕿᕿᖅᑖᓘᑉ, ᐊᒻᒪᓗ ᐅᐊᓐᓇᖅᐸᓯᒻᒥ ᑲᓇᓐᓇᖅᐸᓯᐊᓂ ᕿᕿᖅᑖᓘᑉ (ᒥᓂᔅᑕᐅᕝᕕᖓᓐᓂᒃ ᐊᕙᑎᓕᕇᔾᒃᑯᑦ 2005, Ferguson ᐊᒻᒪᓗ Gauthier 1992, Ferguson 1989; Figure 1a). ᑕᑯᓐᓇᖅᓱᒋᑦ ᐊᓯᖏᑦ ᓈᖅᑐᕐᑲᓐᖏᑦᑐᒥᐅᑕᐃᑦ ᑐᖅᑐᐃᑦ, ᐅᑮᓲᖑᓐᖏᑦᑐᑦ ᓇᐹᖅᑐᓕᓐᓂ, ᑐᑦᑐᓕᒫᖑᒻᒥᓇᑎᓪᓗᒍ ᐊᑯᓂᐊᓗᒃ ᐃᖏᕐᕋᓲᑦ ᕿᑐᙵᒋᐅᕐᕕᓐᓄᑦ (Ferguson 1989, 1998, 2033, Jenkins ᐊᒻᒪᓗ Goorts 2011, Jenkins et al, *in* prep). ᑕᐃᒪᐃᒻᒪᑦ ᕿᕿᖅᑖᓗᒻᒥ ᑐᑦᑐᐃᑦ ᓇᓄᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᕿᕿᖅᑖᓗᒻᒥ ᐱᑕᕐᑲᐅᕇᐊᖓ ᑲᑎᒪᐅᖅᑑᓐᖏᒋᐊᖏᑦ, ᕐᑲᐅᔨᓴᕐᕕᓪᓗᐊᑕᐅᔪᑦ ᑐᓐᖓᕕᕐᑲᖅᓱᑎᒃ ᐆᒪᔪᕐᑲᕐᕕᐅᓗᐊᓐᖑᐊᓲᓂᒃ ᐊᑭᐅᒃᑯᑦ ᕿᑐᙵᒋᐅᕇᐊᖅᑐᖅᑐᓂᒃ (Ferguson 1989). ᕿᖓᒍᒃᑲᓐᓂᖅ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔪᕐᑲᖏᑦᑕ, ᓂᕕᖓᑖᓕᖅᑐᐃᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᑦ (ᐱᒋᐊᖅᓱᑎᒃ 1974-1984–ᒧᓄᑦ), ᐊᒻᒪᓗ ᑐᑦᑐᓕᐹᓗᓐᓂ ᕐᑯᖓᓯᕈᓕᖅᑐᐃᓂᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᒃᑯᑦ (1987-1994 ᐊᒻᒪᓗ 2008-2011), ᐊᑐᐃᓐᓇᐅᑎᑦᓯᒍᑕᐅᓯᒪᒻᒪᑕ ᑐᑭᓯᓂᐊᖅᑎᒪᕇᓐᓂᒃ ᓇᓄᓇᐃᕐᑯᑎᑦᓴᓂᒃ ᐃᑲᔪᖅᓯᒍᑕᐅᔪᓂᒃ ᐃᒻᒥᒃᑰᖓᓂᖏᓐᓂᒃ ᐅᐊᓐᓇᖓᓂ ᓂᒋᐊᓂᓗ ᕿᕿᖅᑖᓘᑉ ᑐᑦᑐᐃᑦ (Jenkins et al. *In prep.,* Jenkins ᐊᒻᒪᓗ Goorts 2011, Feguson et al. 1998, Feguson 1989, Kraft 1984). ᐅᐊᓐᓇᖅᐸᓯᒻᒥ ᑲᓇᓐᓇᖅᐸᓯᒻᒥ ᑐᑦᑐᐃᑦ ᐃᓂᕐᑲᖅᑐᑦ ᐃᒪᖅᐸᓯᒻᒥ ᑲᖏᖅᓱᖏᓐᓂᓗ ᐅᐊᓐᓇᖅᐸᓯᐅᑉ ᑲᓇᓐᓇᖅᐸᓯᐅᑉ ᓯᓈᖓᑕ, ᑐᓐᖓᕕᕐᑲᓗᐊᓐᖑᐊᖅᓱᑎᓪᓗ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᕐᑲᖏᓐᓂᒃ (Ferguson 1989). ᓂᒋᐊᓂ ᕿᕿᖅᑖᓘᑉ ᑐᖅᑐᐃᑦ ᐃᓂᖏᑦ ᐃᑳᖅᓯᒪᔪᑦ ᐊᑈᕙᖓᑕ ᐅᖓᑖᓄᑦ ᕿᕿᖅᑕᐅᑉ ᐊᒻᒪᓗ ᐃᑲᔪᖅᓯᑦᓱᓂ ᑕᑋᕙᓂᑦᓴᐃᓐᓈᖅᑐᓂᒃ ᓄᑦᑕᖅᑐᓂᓪᓗ ᑐᑦᑐᓂᒃ (Ferguson 1989, 1998, 2000, 2003, Redhead ᐊᒻᒪᓗ ᓄᓇ 1979, Elliiot ᐊᒻᒪᓗ Elliot 1975, Tener 1960). ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᑐᖅᑐᐃᑦ ᐅᕐᑲᐅᓯᐅᔪᑦ ᑲᑎᒪᐅᖅᑐᑦ ᐃᓗᐊᓃᑦᑐᑦ ᓇᓄᓇᐃᖅᑕᐅᓯᒪᔫᑉ ᓄᓇᐅᑉ, ᑎᑭᐅᑎᑦᓱᑎᒃ ᐊᔾᔨᐅᓐᖏᑦᑐᓄᑦ ᓈᓴᐅᑎᓄᑦ ᐃᓄᓕᕇᔭᐅᔪᓄᑦ. ᕿᒥᕐᕈᓂᖅ ᑐᑦᑐᐃᑦ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᑭᖑᕚᕇᑎᒍᑦ ᐋᑎᕙᓪᓕᐊᔪᖅ ᑐᑭᓇᒃᑯᓐᓂᕐᑯᓪᓗᕆᑦ ᑖᒃᑯᐊ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ (ᓲᕐᓗ ᐱᖓᓲᓕᖅᑲᖓᔪᑦ) ᖃᓄᕐᓗ ᑲᓲᒪᓂᕐᑲᕐᒪᖔᑕ.

ᓯᓚᐅᑉ ᐊᓯᔾᔨᐸᓪᓕᐊᓂᖓ, ᖃᓂᒻᒪᓲᑦ ᐃᓄᐃᓪᓗ ᐊᐅᓚᓂᖏᑦ, ᐱᕐᑲᓱᐅᑎᑦᓱᓂ ᐅᔭᕋᓐᓂᐊᕐᓂᖅ ᐊᒻᒪᓗ ᑭᓪᓕᕐᑲᓐᖏᑦᑐᓂᒃ ᐊᖑᔭᐅᕐᑲᑦᑕᕐᓂᖅ, ᓇᓄᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐅᓗᕆᐊᓇᖅᑑᑐᐃᓐᓇᕆᐊᕐᑲᕆᐊᖏᑦ ᓂᒋᐊᓂ ᕿᕿᖅᑖᓘᑉ ᑐᑦᑐᖏᓐᓄᑦ (Jenkins et al 2012, Festa-Bianchet et al 2011, Jenkins ᐊᒻᒪᓗ Goorts 2011, Jenkins 2011a, Rippin 1972, Tener 1960, Kelsall 1949, Wright 1944). ᐃᓗᐊᓂᑦᑕᐅᖅ, ᔪᐊᓇᓯ ᑯᓂᓕᐅᓯ, ᐃᓄᑐᕐᑲᖅ ᕿᕿᖅᑕᖅᔪᐊᕐᒥᒃ, ᐅᕐᑲᖅᓯᒪᔪᖅ ᓯᓚᐅᑉ ᐊᓯᔾᔨᕐᓂᖓ ᐊᑦᑐᐃᓂᕐᑲᓪᓚᕆᐊᖓ ᐊᓚᒡᒐᐃᑦᑐᒥᒃ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᕐᓂᖏᓐᓄᑦ ᑐᑦᑐᐃᑦ (Jenkins et al 2012). ᓱᓕᓪᓗ, ᓈᓴᖅᑕᐅᓯᒪᔪᓂᒃ ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᕐᑲᓐᖏᑦᑐᖅ ᑐᑦᑐᐃᑦ ᐊᒥᓲᓂᖏᓐᓂᒃ, ᑐᓐᖓᕕᕐᑲᖅᓱᑐᒃ ᖃᐅᔨᓴᕐᓂᐅᓯᒪᔪᒥᒃ

ᐃᓘᓐᓇᑦᓯᐊᖑᓂ ᓂᒋᐊᓂ ᕿᑭᖃᑖᓘᑉ, ᐊᑐᐃᓐᓇᐅᓚᐅᖃᓯᒪᓐᖏᑦᑐᑦ

ᒫᓐᓇ ᑭᓯᐊᓂ. ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐊᑐᖅᑐᕐᑯᑎᒋᔭᐅᔪᑦ ᕿᑭᖅᑖᓘᒧᒥ ᐱᕐᑲᓱᐅᕝᔾᔪᑦ Williams ᐊᒻᒪᓗ Heard (1986) ᐅᕐᑲᖅᓯᒪᔪᑦ >100,000 ᑐᑦᑐᐃᑦ ᕿᑭᖅᑕᒦᓐᓂᕆᐊᖏᑦ 1985–ᒥ. ᖃᓄᐃᓕᖓᓂᖏᑦ ᓄᑖᕈᕆᐊᖅᑕᐅᔪᑦ 1991 Ferguson ᐊᒻᒪᓗ Gauthier (1992) ᐅᕐᑲᕐᒪᑕ ᑐᑦᑐᐃᑦ ᖃᓄᐃᙵᑦᑎᐊᖏᑦ 60,000-180,000–ᖑᑦᓯᑎᒃ ᑐᑦᑐᐃᑦ ᓂᑭᐊᓂ ᕿᑭᖅᑖᓘᑉ, 50,000-160,000 ᑐᑦᑐᐃᑦ ᐅᐊᓐᓇᖓᓂ ᕿᑭᖅᑖᓘᑉ, ᐊᒻᒪᓗ >10,000 ᑐᑦᑐᐃᑦ ᐅᐊᓐᓇᖅᐸᓯᒻᒥ ᑲᓇᓐᓇᖅᐸᓯᒻᒥ (ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 1a). ᑭᓯᐊᓂᓕ ᑖᒃᑯᐊ ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᑐᙵᕕᕐᑲᙵᑦᑐᑦ ᓇᐅᑐᐃᓐᓇᕐᓂᒃ ᖃᐅᔨᓴᐅᓂᔪᓂᒃ; ᐱᔭᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᕐᓂᐅᕐᑲᑦᑕᖅᓯᒪᔫᖓᓂᑦ, ᓄᓇᓕᓐᓂᒃ ᖃᐅᔨᒪᓂᐅᔪᓂᒃ, ᑐᓴᐅᒪᔭᐅᔪᓂᒃ, ᐊᒻᒪᓗ ᖃᐅᔨᒪᔫᒪᓇᓐᓄᑦ ᐃᓱᒪᒋᔭᐅᔪᓂᒃ (Ferguson ᐊᒻᒪᓗ Gauthier 1992).

ᐊᑐᖅᑕᐅᕙᔪᓐᓂᖅᐸᐅᔪᖅ ᐊᐅᓚᓂᐅᔪᖅ ᓇᓚᐅᑦᓵᕐᓂᕐᒍᑦ ᑕᒪᒃᑮᓐᓂᒃ ᐊᒥᓲᓂᖏᓐᓂᒃ ᑲᑎᒪᐅᕐᓂᖏᓐᓂᓪᓗ ᐆᒪᔪᐃᑦ ᐅᖓᓯᑦᑐᓂᒃ ᖃᐅᔨᕐᓴᕐᓂᖅ (ᓲᕐᓗ Aars et al 2009, Buckland et al 2004). ᑕᒪᓐᓇ ᐊᐅᓚᓂᐅᔪᖅ ᓈᒻᒪᓈᖅᓯᒪᔪᖅ ᐱᓗᐊᖅᑐᒥᒃ ᑐᑦᑐᓕᓐᓄᑦ ᐱᑕᕐᑲᓗᙱᑦᑐᓂᒃ ᓄᓇᐸᐅᔭᐃᑦ ᐃᓗᖏᓐᓂ (Bucklan et al 2004). ᑕᒪᓐᓇ ᐱᔾᔪᑕᐅᓪᓗᓂ, Jenkins (2009a, 2010a, 2011a, 2012) ᓂᐱᕐᑲᕈᑎᕐᑲᖅᓯᒪᔪᖅ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᕐᓴᕐᓂᒥᒃ, ᑐᑭᒧᐊᑦᑐᒥᒃ ᖃᖓᑕᔫᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᕿᑭᖅᑖᓘᒧᒥ ᑐᑦᑐᓂᒃ, ᐊᓚᕐᕕᐃᑦᓯᑎᒃ ᐅᑯᐊ ᐱᕚᓪᓕᕈᑕᐅᔪᑦ:
1) ᐊᑐᕈᓐᓇᕐᓂᖅ ᑐᑭᒧᐊᑦᑐᓂᒃ ᓯᓕᓐᓂᓕᓕᓐᓂᒃ, 2) ᐊᐅᓚᓂᐅᔪᖅ ᑐᙵᕕᕐᑲᖅᑐᖅ ᓂᕈᐅᒋᔭᐅᔪᓂᒃ ᑐᑦᑐᓕᒫᑦ ᑕᑯᔭᐅᔾᔫᙱᑎᐊᖏᑦ, ᐊᒻᒪᓗ 3) ᓴᖅᑮᒍᓐᓇᕐᓂᖅ ᖃᓄᐃᙱᑦᓯᐊᖅᑐᓂᒃ ᑲᑎᒪᐅᖅᑐᓂᒃ ᓇᓚᐅᑦᓵᖅᑕᐅᔪᓂᒃ ᑭᖑᕚᖓᒍᑦ ᐊᑐᓂᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᑦ. ᑖᒃᑯᓇᓂ ᐸᐃᑉᐹᓂ, ᐅᕐᑲᕋᑦᑕ ᓯᕗᓪᓕᖅᐹᒥ ᐊᕐᕌᒍᒥ ᐊᖏᔪᐊᓗᒻᒥᒃ, ᐊᕐᕌᒍᒥᒃ ᐊᑕᐅᓯᐅᙱᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑐᑦᑐᓂᒃ ᕿᑭᖅᑖᓗᒻᒥ, ᓄᓇᕗᒻᒥ (ᑕᑯᓗᒍ Jenkins 2011a.). ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐱᔭᐅᔪᑦ ᓂᑭᐊᓅᖓᔪᑦ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᖏᑦᑕ ᐊᒻᒪᓗ ᐊᑯᓐᓂᕐᑲᖅᓯᓂ ᒫᑦᓯ – ᒪᐃ 2012.

2.0 ᓱᓇᒃᑯᑏᑦ ᐊᐅᓚᓂᐅᔪᓪᓗ

2.1 ᖃᐅᔨᓴᕐᕕᒃ—.ᕿᑭᖅᑖᓗᒃ ᑲᓇᓐᓇᖅᐸᓯᖓᓃᑉᐳᖅ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᒥ ᕿᑭᖅᑕᖏᑦᑕ ᐊᖏᓂᖅᐸᐅᑦᓯᓂ ᕿᑭᖅᑕᓂ ᑲᓇᑕᒥ (ca. 507,451 km^2). ᑖᓐᓇ ᕿᑭᖅᑕᖅ ᑕᑯᑦᓴᐅᑎᑦᓯᔪᖅ ᐅᑭᐅᖅᑕᖅᑐᒥ ᐃᓂᖏᓐᓂᒃ ᓇᐹᖅᑐᕐᑲᙵᑦᑐᒥᐅᑕᐃᑦ ᑐᑦᑐᐃᑦ ᐃᓂᖏᓐᓂᒃ ᐊᒻᒪᓗ ᑐᑦᑐᐃᑦ ᐊᒥᖁᖃᑎᒃ ᓯᐊᒻᒪᖅᑎᖅᓯᒪᕙᔪᑦᑐᑦ ᓄᓇᐸᐅᔭᕐᓂ (Jenkins ᐊᒻᒪᓗ Goorts 2011, Jenkins 2011, Jenkins 2010, Elliot ᐊᒻᒪᓗ Elliot 1975, Tener 1960).

2012–ᒥ ᖃᐅᔨᕐᓴᕐᓂᕐᑲᔪᔪᑦ ᑐᑦᑐᐃᑦ ᓇᒦᓐᓂᖏᓐᓂᒃ ᕿᑭᖅᑖᓘᑉ ᓂᑭᐊᓂ; ᐊᖏᓂᖅᐹᖅ ᓄᓇ ᐃᓂᒋᔭᐅᔪᖅ ᐃᓚᖓᓐᓄᑦ ᐱᖓᓲᓕᖅᑲᖓᔪᑦ ᑐᑦᑐᐃᑦ ᕿᑭᖅᑖᓘᒧᒥ (ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 1a). ᑐᖅᑕᕐᓂᐅᔪᑦ ᓯᕗᕐᖓᓂ ᓇᓗᓇᐃᔭᖅᑕᐅᓯᒪᔪᑦ Ferguson ᐊᒻᒪᓗ Gauthier (1992) ᐊᒻᒪᓗ ᒐᕙᒪᒃᑯᖏᓐᓄᑦ ᓄᓇᕗᑦ (ᒥᓂᔅᑕᐅᕕᖓᑦ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ 2005), ᐊᑐᖅᓯᑕᓗ ᐱᖓᓱᓂᒃ ᑭᓪᓕᒋᔭᐅᔪᓂᒃ, ᐋᖅᑭᒋᐊᕐᕿᔪᑦᓯᒪᑦᓯᑎᒃ ᑐᙵᕕᐅᓪᓗᑎᒃ ᑐᑦᑐᐃᑦ ᓇᒦᓐᓂᖏᓐᓄᑦ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᑦ (1984-2011; Jenkins 2011a, Jenkins ᐊᒻᒪᓗ Goorts, 2011, Jenkins et al *in prep)* ᐊᒻᒪᓗ

ᖃᑦᓯᒐᓛᓂᒃ ᓄᓇᓕᓐᓂᒃ ᑐᑭᓯᓂᐊᕐᓂᐅᔪᓂ (Jenkins et al 2012), ᓇᓗᓇᐃᔭᐃᑦᓱᑎ 2012 ᖃᐅᔨᓴᕐᕕᐅᓯᒪᔪᒥᒃ (ᑎᑎᖅᑰᔭᖅᓯᒪᔪᖅ 1b; ᑕᑯᓗᒍ Jenkins 2011). ᓱᕐᓗ, ᑖᓂᐅᓪ ᖃᑦᑕᓕᒃ, ᐃᒡᓗᓕᒻᒥᐅᖅ ᐅᕐᑲᖅᑐᖅ *“ᓄᑕᕋᐅᑦᓯᓂ ᑐᑦᑐᓕᐊᕐᑲᑦᑕᖅᑐᒥᓃᑦ ᐅᐊᓐᓇᖕᒐᓄᑦ 2012-ᒥ ᖃᐅᔨᓴᕐᕖᐅᔫᑉ ᐃᓂᖕᒐᑕ, ᓂᕆᐊᓅᖅᐸᑦᓱᑎᒃ ᖃᐅᔨᓴᖅᑕᐅᔫᑉ ᐃᓂᖕᒐᑕ. ᐃᓱᒪᖃᖅᑐᖅ ᑕᕝᕙᓂᓪᓗᐊᑦᓯᐊᖅ ᕿᓂᕆᐊᖕᒋᑦ ᐊᒻᒪᓗ ᑐᑦᑐᐃᑦ ᐅᐊᓐᓇᒦᓐᖕᒑᖅᑐᑦ ᐃᑳᓲᖕᒎᓐᖕᒋᒻᒪᑕ ᓂᕆᕐᒍᑦ ᓂᕆᕐᒦᑦᑐᓪᓗ ᐅᐊᓐᓇᓕᐊᖅᐸᒐᑎᒃ.”* ᑕᒪᓐᓇ ᓄᓇ, ᐱᖃᓯᐅᑎᑦᓱᓂ ᓂᕆᐊ ᕿᑭᖅᑖᓘᑉ ᐊᒻᒪᓗ ᖃᓂᒋᔭᖕᒋᑦ ᕿᑭᖅᑕᐃᑦ ᐃᒡᓗᓕᐅᑉ ᐃᒪᖕᒐᓂ, ᑕᓯᐅᔭᕐᔪᐊᑉ ᐃᑭᕋᓴᖕᒐᓂ, ᐋᖅᑭᓱᖅᑕᐅᓯᒪᔪᔪᑦ 9-ᖑᑦᓱᑎᒃ ᐃᒻᒥᑯᐊᖅᑐᖅ ᑐᓐᖕᒐᕕᖃᖅᓱᑎᒃ ᐆᒪᔪᖃᕐᕙᕗᔪᓂᒃ ᑕᐃᒫᒃ ᓇᓗᓇᐃᔭᖅᑕᐅᓯᒪᒻᒪᑕ ᐆᒪᔪᓕᕆᔨᓄᑦ ᐱᓕᕆᖃᑎᖀᑦᑐᓄᑦ (1995; ᑎᑎᖅᑰᔭᖅᓯᒪᔪᖅ 2). ᑕᒪᓐᓇ ᓄᓇᐅᔪᖅ ᐊᑐᓂᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᔪᓂ ᐱᓯᒪᔪᔪᑦ 2,452 km^2 (ᐅᒃᓱᓯᒃᓴᓕᐅᑉ ᓇᑎᕐᓇᖕᒐ) ᑎᑭᑦᓱᒋᑦ 71,844km^2 (Meta Incognita ᑲᖕᒋᖅᓱᖕᒐ) ᑲᑎᑦᓱᑎᒃ 289,715 km^2 (ᑎᑎᕋᕐᕕᒃ 1). ᒪᕐᕉᒃ ᕿᑭᖅᑕᕋᓛᒃ, ᐃᓱᒪᒋᔭᐅᖃᑦᑕᖅᓯᒪᔫᒃ ᐃᓚᒋᔭᐅᒋᐊᖕᒋᒃ ᐅᐊᓐᓇᖕᒐᓂ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᖃᕐᕕᐅᒋᐊᖕᒋᑦ, ᐱᖃᓯᐅᔾᔭᐅᔪᔪᑦ 2012-ᒥ ᖃᐅᔨᓴᕐᓂᕐᒥ, ᐊᑐᖅᑕᐅᖃᓯᐅᑎᑲᓪᓚᒻᒪᖕᒑᑕ ᓂᕆᐊᓂᒃ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᖕᒋᓐᓄᑦ. ᓯᑕᒪᓂᒃ ᓄᓇᓕᓕᑦᑕᖃᔪᔪᖅ ᖃᐅᔨᓴᓂᐅᑉ ᐃᓗᐊᓂ, ᐸᓐᓂᖅᑑᖅ, ᐃᖃᓗᐃᑦ, ᑭᒻᒥᕈᑦ, ᑭᓐᖕᒐᐃᓪᓗ. ᓄᓇ ᐱᖃᓯᐅᔾᔨᔪᒻᒥᔪᖅ ᑲᓇᑕᒥ ᒥᓐᖑᐃᕐᓯᕐᕕᒻᒥᒃ (ᐊᐅᔪᐃᑦᑐᖅ ᑲᓇᑕᒥ ᒥᓐᖑᐃᕐᓯᕐᕕᒃ) ᐊᒻᒪᓗ ᑐᓛᔪᓄᑦ ᑎᒻᒥᐊᖃᕐᕕᒃ (Dewey Sober) (ᑎᑎᖅᑰᔭᖅᓯᒪᔪᖅ 1b).

2.2 ᖃᐅᔨᕐᓂᐅᑉ ᐋᖅᑭᑦᓯᒪᓂᖓ --.ᐊᑐᖅᓯᒪᔪᒍᑦ ᑲᑎᑦᓯᑦᓱᑕ ᖃᐅᔨᓴᓂᐅᓯᒪᔪᓂ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᓂ, ᐊᖑᔭᐅᔪᓂ ᓂᕕᖕᒐᑖᓕᖅᑐᖅᑕᐅᓯᒪᔪᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᓂᒃ, ᖁᖕᒐᓱᒃᑯᑦ ᓇᒦᓐᓂᖕᒋᓐᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᓂᒃ, ᐅᖃᖃᑎᖃᕐᓂᒃᑯᓪᓗ ᑐᓴᐅᒪᑎᑦᓯᒍᑕᐅᑦᓱᓂ ᖃᐅᔨᓴᓂᐅᑉ ᐋᖅᑭᑦᓯᒪᓂᖕᒐ (Jenkins ᐊᒻᒪᓗ Goorts 2013, Jenkins et al. 2012, Jenkins et al. 2011, Jenkins 2010a, Fegruson et al. 1998 Kraft 1984, Chowns 1979, Redhead ᐊᒻᒪᓗ Land 1979, Freeman, M.R. 1976, Elliott ᐊᒻᒪᓗ Elliott 1974, 1975, Jenkins et al. *in prep*). ᑐᑦᑐᐃᑦ ᖃᐅᔨᒪᔭᐅᖃᑦᑕᖅᓯᒪᔪᑦ ᐃᓂᖃᓇᐊᖕᒋᑦ ᕿᑭᖅᑖᓗᒻᒥ, ᐊᐅᔪᐃᑦᑐᓕᓐᓂ, ᐃᓐᓅᕈᓕᓐᓂ, ᐃᑎᔪᓂᓪᓗ ᑰᓕᓐᓂᒃ ᐊᑦᑐᐃᓂᖃᖅᓯᒪᔫᔭᖅᓱᑎᒃ ᓄᓇᒍᑦ ᐃᒻᒥᒃᑰᖅᑎᑕᐅᓂᕐᒥ ᓂᕆᐊᓂ ᕿᑦᑖᓗᒃ ᑐᑦᑐᖕᒋᑦᑕ ᐅᐊᓐᓇᒦᑦᑐᑦ ᐊᒻᒪᓗ ᐅᐊᓐᓇᖅᐸᓯᒻᒥ ᑲᓇᓐᓇᖅᐸᓯᒻᒥ (Jenkins et al *in prep,* Jenkins ᐊᒻᒪᓗ Goorts 2013, Ferguson ᐊᒻᒪᓗ Gauthier 1992, ᒥᓂᔅᑕᐅᕝᕕᖕᒐᓂᒃ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ 2005), ᑭᓯᐊᓂᑦᑕᐅᖅ ᓴᓂᐊᓃᑦᑐᖅ ᕿᑭᖅᑕᖅ ᐃᒡᓗᓕᐅᑉ ᐃᒪᖕᒐᓂ, ᑕᓪᓗᕈᑎᒥ, ᐃᒻᒪᖃᓗ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐃᑭᕋᓴᖕᒐᓂ (Jenkins et al. 2011, Jenkins 2010a, Feguson et al. 1998, Elliot ᐊᒻᒪᓗ Elliot, 1974, 1975.) ᐊᑐᖅᓱᓱᑦ ᓄᓇᖑᐊᒥ 10.0 (www.ESRI.com), ᓴᖅᑮᓯᒪᔪᒍᑦ ᐊᐅᓚᓂᐅᔪᒥᒃ, ᐋᖅᑭᓱᖅᓯᒪᑦᓱᑎᒃ ᑐᑭᓕᐊᖅᑐᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᑦ ᓇᑭᑐᐃᓐᓇ ᐱᕆᐊᕐᕕᖃᕐᓱᑎ. ᑐᑭᓗᐊᖅᑐᑦ ᐋᖅᑭᑦᓯᒪᔪᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᔫᒃᑯᑦ, ᐊᑯᓐᓂᖃᖅᓱᑎ 10 ᑭᓗᒦᑕᓂ, ᑲᓇᓐᓇᒦᓐᖕᒑᖅᓱᑎ ᐱᖕᒐᓐᓇᓕᐊᖅᐸᓪᓕᐊᔪᑦ ᖃᐅᔨᓴᕕᒻᒥ (ᑎᑎᖅᑰᔭᖅᓯᒪᔪᖅ 3a). ᑭᖑᕐᖕᒐᒍᑦ Buckland et al 2001, ᐊᑯᓐᓂᕆᐅᔭᔪᑦ ᓂᕈᐊᖅᑕᐅᓯᒪᔪᑦ ᓇᓕᖅᑲᓕᓅᑦᓯᐊᓕᖅᑎᑕᐅᑦᓱᑎᒃ, ᓈᒻᒪᓈᖅᓯᒪᓗᑎᒃ ᑕᑭᔪᑯᑖᑦ, ᖃᐅᔨᓴᐅᕕᐅᔪᓪᓗ. ᐋᖅᑭᑦᓯᒪᓂᖕᒋᑦ ᑐᑭᓗᐊᖅᑐᑦ ᐋᖅᑭᑦᑕᐅᓯᒪᔪᑦ ᐊᑦᑐᐊᖃᖁᔭᐅᓪᓗᑎ ᑐᑦᑐᑦᑲᖅᑐᐃᓐᓇᓇᐊᓕᓐᓄᑦ ᖃᐅᔨᒪᔭᐅᔪᓄᑦ ᓄᑦᑕᕐᕕᐅᒋᐊᖕᒋᑦ (Buckland et al. 2011, ᒥᓂᔅᑕᐅᕝᕕᖕᒐᑦ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᓐᖕᒋᑦᑐᑦ ᑲᑎᖅᓱᖅᓯᒪᔪᑦ,

Jenkins et al. *in prep*). ᓄᓇᓐᖑᐊᕐᒥᒃ, ᑐᕋᐃᓐᓇᖅᑐᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᑦ ᓄᓇᓐᖑᐊᑎᒍᑦ ᑕᒻᒪᕇᒃᑯᑎᓄᑦ ᐃᑖᔾᐅᓯᒪᔪᑦ (Garmin GPSMAP 196, 276C) ᐊᑐᖅᑕᐅᔪᑦ ᖁᑮᒎᓕᓐᓄᑦ ᖃᐅᔨᓴᕐᓂᕐᒥ. ᑐᕋᐃᓐᓇᖅᑐᑦ ᓄᓇᓕᒫᒨᖓᔪᑦ ᐋᒡᒐᑐᐊᖅ ᐊᐅᔭᐃᑦᑐᓕᐌᓘᓐᓂᒃ (ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 3a) ᐊᒻᒪᓗ ᖃᖓᑕᔪᑦᓱᑎᒃ ᐊᑐᖅᓱᑎᒃ ᑐᕋᐃᓐᓇᖅᑐᒥᒃ (Buckland et al 2011).

ᖃᐅᔨᓴᕐᓂᖅ ᐋᖅᑭᑦᓯᒪᔪᔪᖅ ᐅᑭᐅᕐᒧᑦ (ᒫᑦᓯᐅᑉ ᕿᑎᐊᓂᒃ ᕿᑎᐊᓄᑦ ᐃᐹᐳᑦ)

ᕿᑐᕐᖏᐅᓐᖏᓐᓂᖏᓐᓂ, ᑐᑦᑐᐃᑦ ᓄᑦᑕᓗᐊᖅᑎᓐᓇᒋᑦ (ᐱᓱᒐᔪᑦᑐᑦ 2.14 km/ᐅᓪᓗ, SE 0.14; ᓇᓚᐅᑦᓵᖅᑕᐅᔪᑦ ᑐᓐᖓᕕᕐᑲᖅᑐᑦ ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᓂᒃ ᖁᖓᓯᕐᒥᐅᑕᓕᖅᑕᐅᓯᒪᔪᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᔪᓂᒃ, ᒫᑦᓯ 15 - ᐃᐹᐳᑦ 15, 1987 -1991; Jenkins et al. *in prep*), ᖃᐅᒪᑦᓯᐊᕐᓂᐅᔪ10 ᓂᕈᒥᓐᓃᓪᓗ ᐱᕕᕐᑲᖅᑎᑦᓯᒪᔪᑦ ᐊᑦᑕᓐᖏᑦᑐᒃᑯᑦ ᐊᐅᓚᓂᖏᓐᓂᒃ ᖁᑮᒎᑏᑦ, ᐊᐳᑎᓗ ᑕᑯᕕᑦᓴᑦᓯᐊᖑᑦᓱᓂ ᐆᒪᔪᕐᓂᒃ ᖃᓄᐃᓕᖓᓂᖏᓐᓃᓪᓗ.

2.3 ᓄᓇᒥ ᐊᐅᓚᓂᐅᔪᑦ-- ᖃᐅᔨᓴᕐᕕᐅᔪᖅ ᑐᕋᐃᓐᓇᖅᑐᖅ ᖃᖓᑕᕕᐅᔪᖅ ᐊᑐᖅᓱᑎᓱ 2 Bell 206 LR ᐃᓴᕈᓕᒻᒥᒃ ᖃᖓᑕᔫᒥᒃ ᖁᕝᕙᓱᓐᓂᖅᑲᖅᓱᑎᒃ 120 ᒦᑕᐃᑦ ᒥᑦᓵᓃᑦᑐᓂᒃ ᓄᓇᒥᒃ ᐃᖏᕐᕋᓂᖅᑲᖅᓱᑎᓪᓗ ca. 140 km/h ᑕᒃᓐᓇᖅᓯᑲᓐᓂᖁᓪᓗᒋᑦ. ᖁᑮᒎᑦ ᐊᑐᐃᓐᓇᖃᑕᐅᔫᒥᔪᑦ ᐃᖃᓗᓐᓂ (63.729943 N, -68.448588 W), ᐊᒻᒪᓗ ᐃᒻᒥᒃᑯᑦ, ᓄᓇᓕᖕᒋᓐᓂ ᐸᓐᓂᖅᑑᖅ (66.144279 N, -65.71706 W) ᑭᖓᐃᓪᓗ (64.232268 N, -76.542675 W). ᒪᐃ ᕿᑎᖓᓂ, ᖁᑮᒎᓕᑦᑏᑦ ᑲᑎᒃᑲᓐᓂᔪᔪᑦ ᓂᑯ ᕿᑭᖅᑕᖓᓂ ᖃᐅᔨᓴᕐᕕᒻᒥ ᓄᓇᓕᓐᓂ (66.596447 N, -71.526536 W) (ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 1b). ᐊᑕᐅᓯᖅ ᖁᑮᒎᓕᒃ ᓴᒃᑯᑕᐅᔪᔪᖅ ᒪᐃ 17 ᐊᐃᐸᖓ ᐃᓂᓕᐅᖅᑕᐅᒃᑲᓐᓂᖅᓱᓂ ᓄᕌᔾᓐᓂ (71.3264 N, -79.3762 W), ᐱᔭᕇᓇᐊᖅᑐᖅᓱᑎᒃ ᖁᑦᓯᓂᖅᐹᒦᑦᑐᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ. ᐊᑐᓂᑦ ᖁᑮᒎᑏᑦ ᐃᖅᑲᓇᐃᔭᖅᑎᕐᑲᖅᓱᑎᒃ ᓯᑕᒪᓂᒃ ᖃᐅᔨᓴᖅᑎᓂᒃ, ᐱᕐᑲᓯᐅᑎᑦᓱᓂ ᐊᕐᑯᑎᖓᑦ: ᒪᕐᕌᒃ ᓯᕗᓂᖓᓂ ᖃᐅᔨᓴᖅᓯᐅᑎᐅᔫᒃ (ᐊᕐᑯᑎ ᑐᑦᑐᓕᕆᔨᓗ) ᑑᕋᕐᑲᓗᐊᓐᖑᐊᖅᓱᑎᒃ ᑐᕋᐃᓐᓇᖅᑐᒥᒃ ᖃᐅᔨᓴᕐᕕᒻᒥᒃ ᓯᕗᕌᓂ ᖁᑮᒎᓕᐅᑉ, ᐊᐃᐸᖓᒃ ᑐᓄᐊᓃᑦᑑᒃ ᖃᐅᔨᓴᖅᑏᒃ (ᐆᒪᔪᓕᕆᔩ ᐊᒻᒪᓗ ᓄᓇᓕᓐᓂ ᐊᖑᓇᓯᑦᑎᓅᓐᖓᓛᖅᑐᖅ) ᕿᓂᖅᑎᓪᓗᖏᑦ ᓴᓂᕋᖏᓐᓂ ᖁᑮᒎᑏᑦ ᖃᓕᓇᓕᖅᓯᒪᑦᓱᑎᒃ ᓯᕗᕌᓂᒃ ᑕᒃᓐᓇᖅᑕᐃᓪᓗ. ᖁᑮᒎᓕᒻᒥ ᐱᓕᓇᔪᑦ ᐱᖓᓱᐃᓐᓇᕈᔪᔪᑦ ᐃᖅᑲᓇᐃᔭᖅᑏᑦ ᐊᓯᔾᔨᑎᓪᓗᒋᑦ (ᓃᕐᓗ ᓯᑕᒪᑦ ᐅᓪᓗᐃᑦ) ᐊᒻᒪᓗ ᓄᑦᑎᐸᓪᓕᐊᑎᓪᓗᒋᑦ ᐊᓯᖏᓐᓄᑦ ᑐᐱᖅᓯᒪᕕᐅᔪᓄᑦ (ᓃᕐᓗ ᒪᕐᕌᒃ ᐅᓪᓘᒃ ᐃᓚᖓᓂ). ᑕᒪᓐᓇᐅᑎᓪᓗᒍ, ᐊᑕᐅᓯᖅ ᖃᐅᔨᓴᖅᑎ ᓯᕗᒧᑦ ᖃᐅᔨᓴᖅᓱᓂ, ᒪᕐᕌᒃ ᓴᓂᕋᖏᓐᓂᒃ ᖃᐅᔨᓴᖅᑎᓪᓗᒋᒃ ᖁᑮᒎᓕᐅᑉ, ᐅᖓᑖᓅᖓᑭᐊᒃᑕᒃᓐᓂᖅᓱᑎᒃ ᓯᕗᒦᑦᑑᑉ ᕿᓂᕙᖓᑕ. ᑕᒪᓐᓇ ᐊᑦᑐᐃᓂᕐᑲᖅᓯᒪᔪᕈᓐᖏᑦᑕᕗᑦ ᑐᑦᑐᓂᒃ ᑕᑯᓐᓇᕐᓂᑎᓐᓂᒃ ᐋᖅᑭᐊᖅᓯᒪᔪᒐᑦᑕ ᐊᒥᒐᖅᓯᓕᕋᑦᑕ ᐊᑕᐅᓯᕐᒥᒃ ᖃᐅᔨᓴᖅᑎᒥᒃ. ᑐᕋᐃᓐᓇᖅᑐᒥᒃ ᐊᑐᔪᔪᒍᑦ ᑐᕋᐃᓐᓇᖅᑐᖅ ᓯᕕᑐᑦᓱᓂ; ᑕᐃᒪᐃᓐᓂᖓᓄᑦ, ᑐᑦᑐᐃᑦ ᑕᑯᔭᐅᔪᓕᒫᑦ ᑲᑎᖅᓱᐃᒍᑕᐅᔪᔪᑦ ᐅᖓᓱᓐᓂᓕᓐᓂᒃ ᖃᐅᔨᓴᕕᒻᒥᒃ (Buckland et al 2001).

ᑐᑦᑐᐃᑦ ᑕᑯᔭᐅᔪᑦ ᖃᖓᑕᔪᓄᑦ ᑐᕋᐃᓐᓇᖅᑐᒥᒃ ᐃᓯᒪᒋᔭᐅᔪᑦ ᑕᕝᕗᓃᓪᓗᐊᕐᓂᓇᐊᖏᑦ. ᖃᐅᔨᔭᐅᔪᑦ ᓄᐊᑕᐅᓯᒪᔪᑦ ᓄᑦᑕᖅᓱᑎᒃ ᐊᑯᓐᖏᓐᓂ ᖃᐅᔨᓴᕖᑦ, ᐆᒪᔪᐃᑦ ᑕᑯᔭᐅᔪᑦ, ᐅᕝᕙᓗ ᐅᖅᓱᓇᐊᖅᑐᖅᓱᑎᒃ

ᐃᓱᒪᒋᔭᐅᓯᒪᔪᑦ ᓯᓚᑖᓂᒋᐊᖏᑦ. ᑐᑦᑐᐃᑦ ᓇᒧᑐᐃᓐᓈᓲᖑᒻᒪᑕ ᓇᓗᓇᐃᖅᓯᒪᕐᓯᐊᖅᑐᓂᓪᓗ ᑲᑎᒪᐅᕈᓐᓇᖅᓱᑎᒃ, ᐊᑐᓂᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᑦ ᑕᑯᓵᐅᑎᑦᓯᓯᒪᔪᑦ ᑲᑎᒪᔪᓂᒃ ᑐᑦᑐᓂᒃ, ᐅᖃᐅᓯᐅᔪᑦ ᐊᑕᐅᓯᖅ ᐊᑕᐅᓯᐅᓐᖏᑦᑐᕐᓘᓐᓂᑦ ᐆᒪᔪᖅ ᐃᓗᐊᓃᑦᑐᖅ ca 100 m ᐊᑯᓐᓂᕐᒥᓂ (ᑕᑯᑦᓱᒋᑦ Jenkins et al 2011). ᖃᐅᔨᓴᖅᓯᒪᔪᒍᑦ ᑕᑯᔭᐅᓯᒪᔪᓂᒃ ᓄᑦᑕᖅᓱᑕ ᑐᕋᐃᓐᓇᖅᑐᒥᒃ ᑎᑎᕋᖅᑕᐅᑦᓱᓂ ᐃᓂᐅᔪᖅ (ᓲᕐᓗ ᕿᑎᐊᓂ ᑲᑎᒪᔪᑦ ᑕᑯᐅᔭᐅᒋᐊᓐᖓᑎᓪᓗᒋᑦ), ᑲᑎᒪᐅᖅᑐᑦ ᐊᖏᓂᖏᑦ, ᐊᕐᓇᐅᓂᖏᑦ/ᐊᖑᑕᐅᓂᖏᑦ ᐊᕐᕌᒍᖏᓪᓗ. ᑐᑦᑐᐃᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐊᕐᓇᐅᓂᖏᑦ ᐊᖑᑕᐅᓂᖏᓪᓗ, ᐃᓐᓇᐅᓂᖏᑦ (>2 years), ᐊᕐᕌᒍᕐᑲᕐᓂᖏᑦ (>1 ᐊᕐᕌᒍ ᐊᒻᒪᓗ < 2) ᐅᕝᕙᓗ ᓄᕐᕋᖅ (<1 ᐊᕐᕌᒍ). ᑐᑦᑐᐃᑦ ᐃᐸᕆᔭᐅᑦᓯᐊᕐᓂᖏᑦ ᐊᑦᑕᓇᑦᑕᐃᓕᒪᓂᖏᓪᓗ ᓯᕗᓪᓕᐅᔾᔭᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᕐᓂᕐᓗ ᐊᑯᓃᖅᐸᖓᓂ ᐅᓚᕕᓐᖏᓂᖅᓴᐅᓪᓗᒋᑦ. ᐊᑐᓂᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᓄᑦ, ᑐᑦᑐᕐᑲᕝᕕᒃ ᖃᓄᐃᓕᖓᒻᒪᖔᖅ ᑎᑎᖅᑕᐅᑦᓱᓂ ᐊᒻᒪᓗ ᓈᓴᐅᓱᖅᑕᐅᑦᓱᓂ ᒪᓐᑦᑑᒻᒪᖔᖅ ᒪᓂᕋᒻᒪᖔᕐᒎᓐᓂᑦ ᐃᓂᒋᔭᐅᔪᖅ. ᒪᓐᑦᑐᒥ (ᐅᖓᑖᓂ 100 m ᐊᖏᓂᓕᒻᒥ ᖃᐅᔨᓴᕝᕕᒻᒥ), ᓄᓇ ᓇᓗᓇᐃᒃᑯᓯᖅᑕᐅᔪᖅ F= ᒪᓂᕋᑦᑐᖅ, R = ᖃᖅᑲᕐᑲᐅᖅᑐᖅ, ᐅᕝᕙᓗ M = ᐃᓐᓈᕈᐃᑦ. ᖃᓂᓈᕐᓂᖅᓴᓄᑦ 100 m–ᓂᒃ ᐊᖏᓂᕐᑲᖅᓱᓂ ᖃᐅᔨᓴᕝᕕᒃ), ᓄᓇ ᓇᓗᓇᐃᒃᑯᓯᐅᖅᑕᐅᑦᓱᓂ F = ᒪᓂᕋᑦᑐᖅ, 2= ᓯᕗᖓᒐᓛᑦᑐᖅ, ᐅᕝᕙᓗ 3 = ᐃᓐᓈᕈᖅ. ᐃᓂᒋᔭᐅᔪᓈᖓᔪᑦ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᑦ ᓄᐊᑕᐅᓯᒪᔾᑉ ᑎᒍᒥᐊᒐᕐᓂ ᑕᒻᒪᕼᒃᑯᑎᓂ (Garmin GPSMAP 196, 276C, 76S, ᐊᒻᒪᓗ 78C, Oregon 250T, ᐊᒻᒪᓗ 450T), ᑎᑎᕋᖅᑕᐅᓯᒪᒻᒥᑦᓱᑎᒃ ᕐᑯᓛᒎᓛᑦ ᖃᓄᐃᓕᖓᓂᖏᑦ 20–30 ᓴᒃᓐᓵ ᐊᓂᒍᑐᐊᕋᐃᒻᒪᑦ ᓇᓗᓇᐃᖅᓯᒪᔪᓂᒃ ᑎᑎᕋᖅᓯᒪᔪᕐᑲᕈᒪᓪᓗᑎᒃ ᐊᑐᓂᑦ ᖃᖓᑕᓂᐅᔪᓄᑦ (ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 3b). ᐆᒪᔪᐃᑦ ᐃᐸᔭᐅᑦᓯᐊᖅᐸᑕ, ᐊᕙᑎᒋᔭᐅᔪᑦ, ᐅᖅᓱᐊᓗᐃᑦ ᐱᕕᖃᕐᓂᐅᔪᕐᓗ, ᖃᐅᔨᓴᕈᑕᐅᔪᓂᒃ ᑐᑦᑐᓂᒃ ᓄᐊᑕᐅᔪᔪᑦ ᕿᖑᕝᕖᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᕐᓗᑎᒃ.

ᐃᑲᔪᖅᓯᒍᑕᐅᔪᖅ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᐅᔪᓂᒃ, ᖃᐅᔨᓴᕐᓴᕕᕗᑦ, ᖃᐅᔨᓴᕐᓂᑦᑕ ᐋᖅᑭᑦᓯᒪᓂᖓ, ᐊᒻᒪᓗ ᓄᓇᒥ ᐊᐅᓚᓂᐅᔪᑦ, ᐋᖅᑭᑦᑕᐅᓯᒪᔪᑦ ᑲᔪᓯᑎᑕᐅᓯᒪᑦᓱᑎᒃ ᑎᑭᐅᑎᒍᒪᓪᓗᑎᒃ ᐱᖓᓱᓄᑦ ᓂᕆᐅᒋᔾᔪᐊᑕᕐᓄᑦ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᓂᕐᒧᑦ (ᐊᑖᓂ), ᓴᖅᐲᓗᑎᒃ ᓇᓚᐅᑦᓵᖅᑕᐅᔪᓂᒃ ᑲᑎᒪᔪᓂᒃ (Anderson et al 2001; Buckland et al., 2001); 1) ᐆᒪᔪᓕᒫᑦ ᑕᑯᔭᐅᒍᒪᔪᑦ ᑐᕋᐃᓐᓇᖅᑑᑦᑐᑦ ᖃᐅᔨᓴᖅᑕᒥ ᖃᐅᔨᔭᐅᔪᒧᑦ; 2) ᐆᒪᔪᐃᑦ ᑕᑯᔭᐅᒍᒪᔪᑦ ᑕᑯᔭᐅᔪᒧᑦ ᐃᓂᓪᓗᐊᑕᖏᓐᓂᒃ ᕿᒦᒋᐊᓚᐅᓐᖏᓐᓂᖏᓐᓂ ᖃᐅᔨᓴᖅᑐᒥᒃ (ᓲᕐᓗ ᕿᒦᑦᓱᑎᒃ ᖃᖓᑕᔫᕐᒥᒃ); ᐊᒻᒪᓗ 3) ᐅᖓᓯᓐᖏᑦ (y) ᑐᑭᒧᐊᑦᑎᒧᑦ ᐊᑐᓂᑦ ᖃᐅᔨᔭᐅᔪᓄᑦ ᑲᑎᒪᐅᖅᑐᓄᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ ᓈᒻᒪᓈᖅᓯᒪᔪᓂᒃ. ᐅᖃᖃᑎᖑᓐᓂᕐᒥ, ᐊᑐᐃᓐᓇᐅᑎᑦᓯᔪᒍᑦ ᖃᐅᔨᓴᕐᓂᒥᒃ ᐊᑐᓂᑦ ᑖᒃᑯᓇᓐᖓᑦ ᐱᕕᐅᓯᒪᔪᓂᒃ.

2.4 ᕿᒥᕐᕈᓂᖅ--.ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᑎᑕᐅᔪᑦ ᑕᒻᒪᕼᒃᑯᑎᓄᑦ ᐊᑐᖅᓯᑕᓗ ᓄᓇᓐᑦᖑᐊᓂᒃ 10.0 ᖃᐅᔨᓴᕈᑎᒋᑦᓱᒋᑦ ᐅᖓᓯᓐᖏᓐᓂᒃ (y) ᐊᑐᓂᑦ ᐆᒪᔪᕐᓂᒃ ᑕᑯᕕᐅᔪᑦ ᕿᓂᕝᕕᒧᑦ (ᑕᑯᑦᓴᐅᑎᑕᐅᔪᑦ ᖃᖓᑕᕝᕕᒃᑯᓪᓗᐊᖅ: Marques et al. 2006). ᑕᑭᓂᖏᑦ ᖃᖓᑕᕝᕕᐅᔪᑦ, ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᑦᓯᒪᔪᖅᑎᒍᑦ, ᖃᐅᔨᓴᖅᑕᐅᓯᒪᒻᒥᔪᑦ ᓄᓇᖑᐊᓂ 10.0 (Aars et al. 2009, Jenkins et al. 2011). ᑕᒪᑦᑕᐃᓕᒍᑎᒋᓪᓗᒍ, ᐊᑐᔪᔪᒍᑦ North Pole Azimuthal Equidistance Projection ᑐᓐᖓᕕᖅᑲᖅᓱᓂ ᐊᑐᓂᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᔪᓂᒃ ᖃᐅᔨᓴᖅᓱᒋᓪᓗ ᑐᑭᒧᐊᖅᑐᓕᒫᑦ ᐊᖏᓂᖅᑲᖅᓱᓂ 1:10,000–ᒥᒃ (ᓈᒻᒪᓈᖅᓯᒪᔪᖅ ±20 m); ᐅᖓᓯᓐᓂᖏᓪᓗ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ 1:5,000 (ᓈᒻᒪᓈᖅᓯᒪᔪᖅ ±10 m)

ᐊᑐᖄᔭᕗᑦ Buckland et al. (2001, 2004) ᐊᒻᒪᓗ ᐊᑐᖅᓱᑕ ᐊᐅᓚᓂᕐᒧᑦ ᐅᖓᓯᓐᓂᐅᖁᒥᒃ ᓈᓴᐅᑎᓕᒃ 6.0 (Thomas et al. 2009), ᐊᑐᖅᑕᐅᑦᓱᓂ ᑐᕋᐃᓐᓇᖅᑐᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᖁᒥᒃ ᐊᒻᒪᓗ ᓇᓚᐅᑦᔮᕐᓂᖅ ᑲᑎᒪᖁᓂᒃ ᐊᒥᓲᓂᖕᒋᓐᓂᓪᓗ ᑐᑦᑐᐃᑦ. ᐊᑐᖅᓱᑎᒃ ᐊᑐᖅᑕᐅᒐᖁᑦᑐᒥᒃ ᐅᑉᐸᓗ ᐅᖓᓯᓐᓂᐅᒐᖁᑦᑐᒥᒃ ᖃᐅᔨᓭᕐᓂᕐᒧᑦ (CDS), ᐊᑐᖃᖁᒍᑦ ᖃᐅᔨᓇᕐᓂᐅᓴᑐᐃᓐᓇᖅᑐᓂᒃ ᑐᑦᑐᓂᒃ, ᐊᒥᓲᓂᖕᒋᓐᓂᒃ, ᐅᖓᓯᓐᓂᕐᒥᒃ ᐊᐅᓚᓂᕐᑲᖅᑎᓪᓗᒋᑦ. ᐃᒫᒃ, ᖃᐅᔨᓂᕐᒧᑦ ᐊᐅᓚᓂᐅᖁᖅ ᑕᑯᓭᐅᑎᑦᖁᖅ ᖃᐅᔨᓂᐅᓴᓇᑐᐃᓐᓇᕐᓂᖕᒋᓐᓂᒃ ᑐᑦᑐᐃᑦ, ᐅᖓᓯᓐᓂᕐᑲᑐᐊᖅᐸᑦ (y)−ᒥᒃ ᕿᓂᕐᕕᐅᖁᒥᒃ (Buckland et al. 2001). ᐃᓕᑕᖅᓯᓂᖅ ᐊᓯᖕᒋᓐᓂᒃ ᐊᔾᔨᒌᓐᖕᒋᓐᓂᐅᖁᓂᒃ, ᐊᑦᑐᐃᓂᕐᑲᑐᐃᓪᓇᓇᐊᓕᒃ ᖃᐅᔨᔭᐅᒍᓐᓇᖅᑐᓂᒃ, ᐊᒥᓲᓂᖕᒋᑦᑕ ᓇᓚᐅᑦᔮᖅᑕᐅᓂᖕᒋᑦ ᐱᓯᒪᒻᒥᖁᑦ ᐊᑐᖅᓱᓱᒃ ᐊᔾᔨᒌᓐᖕᒋᑦᑐᓂᑦ ᐅᖓᓯᓐᐅᖁᓂᒃ ᖃᐅᔨᓴᕈᑎᓂᒃ, ᖃᐅᔨᔭᐅᓂᐅᓴᑐᐃᓐᓇᕐᓂᖕᒋᓐᓂᒃ ᐊᑐᖅᓱᑕ ᐊᐅᓚᓂᖕᒐᑎᒍᑦ ᐅᖓᓯᑦᑐᒥᒃ ᐊᒻᒪᓗ ᓱᓕ ᐊᑲᑕᐅᓯᒃᑲᓐᓂᖅ (Buckland et al. 2004). ᑕᒪᓐᓇ ᐊᐅᓚᓂᐅᖁᖅ ᕿᒥᕐᕈᔭᐅᖁᖁᖅ ᐱᕚᓪᓕᕐᑯᓪᓗᒍ ᓲᖕᒋᖅᑑᑕᐅᒍᓐᓇᕐᓂᖕᒋᑦ ᑲᑎᒪᐅᖅᑐᑦ ᓇᓚᐅᑦᔮᖅᑕᐅᓂᖕᒋᑦᑕ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᖁᓂᒃ (ᓲᕐᓗ ᓄᓇᖕᒍᐊᑎᒍᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᖁᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᖁᖅᑎᒍᑦ), ᐊᒻᒪᓗ ᓈᒻᒪᓈᑦᓯᐊᑲᓐᓂᕐᑯᓪᓗᖕᒋᑦ ᑲᑎᒪᐅᖅᑐᓂᒃ ᓇᓚᐅᑦᔮᕐᓂᐅᖁᑦ (Marques et al 2007). ᐊᑐᖅᓱᑕ ᖃᐅᔨᓴᕈᑕᐅᖁᓂᒃ (ᐊᐅᓚᓂᓐᓪᓗᐊᑕᐅᖁᑦ/ᐊᐅᓚᓂᕐᒧᑦ ᐊᖏᓪᓕᒋᐊᕈᑕᐅᖁᑦ) ᐃᓱᒪᓕᐅᕈᑕᐅᖁᑦ Marques et al. 2007 ᐊᒻᒪᓗ Buckland et al. (2001, 2004). ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᖁᑦ ᕿᒥᕐᕈᔭᐅᖁᑦ ᒪᓕᑦᓱᑎᖕᒋᑦ Buckland et al. (2001), ᐊᑑᑎᓕᖅᓱᑕ (w) ᐅᖓᓯᓐᓂᓕᒻᒥᒃ 2,800 m ᕿᒥᕐᕈᓂᓕᒫᓂ, ᑐᓐᖓᕕᒋᑦᓱᒋᑦ ᐃᓱᒪᓕᐅᕈᑕᐅᓯᒪᖁᑦ ᐋᖅᑕᐅᕐᑯᔭᐅᑦᓱᑎᒃ ᓯᓚᑖᓂᖓᔭᓐᖑᐊᖅᑐᑦ, ᐊᖏᓂᖓ ᑕᑯᓐᓇᕐᓗᒍ ᖃᐅᔨᔭᐅᖁᓂ ᑲᑎᒪᐅᖅᑐᓂ ᐊᑐᖅᑕᐅᓗᓂ ᐋᖅᑭᑦᓱᐃᒍᑎ ᑲᑎᓱᖅᑕᐅᖁᓂᒃ (ᒪᕐᕈᒃ ᖃᐅᔨᓭᓂᐅᖄᒃ ᐃᓚᒍᑦᓯᐅᔾᔨᓯᒪᓐᖕᒋᑦᑐᑦ ᑖᑦᓱᒪᓐᖓᑦ ᐊᑦᑐᐃᓂᕐᑲᓗᐊᓐᖕᒋᑦᑐᖅ ᓇᓚᐅᑦᔮᖅᑕᐅᖁᓂᒃ). ᓇᓚᐅᑦᔮᕐᓂᖅ ᑲᑎᒪᐅᖅᑐᓂᒃ ᐊᒥᓲᓂᖕᒋᓐᓂᓪᓗ ᓄᓇᖕᒍᐊᑎᒍᑦ, ᐊᑐᖅᑐᒍᑦ ᓄ ᓇᕐᖁᐊᕐᒨᑦ ᐊᑐᖅᑕᐅᓲᒥᒃ ᖃᐅᔨᔭᐅᖁᓄᑦ ᐊᐅᓚᓂᕐᒧᑦ (ᖃᐅᔨᓴᕐᓂᐅᖁᑦ ᐃᓄᐃᓴᓗᐊᕐᓂᑯᖕᒋᓐᓄᑦ ᓈᒻᒪᓈᖅᓯᒪᓂᐊᕐᓗᑎᒃ ᐃᒻᒥᒃᑯᑦ ᖃᐅᔨᔭᐅᖁᓄᑦ ᖃᐅᔨᓴᕐᕕᓐᓂ), ᐊᒻᒪᓗ ᐊᑐᖅᑕᐅᓯᒪᖁᑦ ᖃᐅᔨᓴᕐᓂᐅᖁᑦ ᐱᕚᓪᓕᑎᑦᓯᒍᑕᐅᓗᑎᒃ ᐊᐅᓚᓂᐅᖁᒥᒃ (ᑕᐃᒫᒃ ᐃᓱᒪᓕᐅᕈᑕᐅᓯᒪᒻᒪᑦ Marques et al. 2007, Buckland et al 2001, 2004).

ᐊᑐᖅᓯᒪᖁᒍᑦ ᓄᓇᕐᖁᐊᕐᒥ ᑲᑎᒪᐅᖅᑐᓄᑦ ᐊᖏᓂᐅᖁᒥᒃ ᓇᓚᐅᑦᔮᖅᑕᐅᓯᒪᖁᒥᒃ ᐊᑐᖅᓱᑎᒃ ᐊᖏᓂᖓᓂᒃ ᐊᓚᒡᒍᐃᑦᑑᑉᐸᑕ ᕐᑯᑦᓯᓐᓂᓕᒻᒥ 0.15. ᐊᓚᒡᒐᐃᑦᑑᖕᒋᑉᐸᑦ, ᓄᓇᕐᖁᐊᕐᒨᖕᒐᖁᖅ ᑲᑎᒪᐅᖅᑐᓄᑦ ᖃᐅᔨᓭᐅᓂᖁᑦ ᐊᑐᖅᑕᐅᖁᖁᑦ. ᓇᓚᐅᑦᔮᖅᓯᒪᖁᒍᑦ ᐊᔾᔨᒌᓐᖕᒋᑦᑐᓂᒃ ᐊᑐᖅᓱᑕ ᑕᐃᔭᐅᖁᒥᒃ nonparametric bootstrap 999−ᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᑲᓐᓂᖅᓯᒪᖁᖅᑲᖅᓱᑎᒃ ᐊᐅᓚᔾᔭᑦᑕᐅᓯᒪᖁᑦ ᖃᐅᔨᓭᓂᐅᖁᓄᑦ ᐃᓇᖕᒋᑦᓱᑎᒃ ᐊᑕᐅᓯᕐᒥᒃ ᑐᑭᓕᐊᖅᑐᒥᒃ (Marques et al 2007). ᐊᑐᖅᓱᑕ ᑐᓴᖅᑕᑎᓐᓂᒃ Akaike−ᒥᒃ ᐃᓗᓕᖕᒋᓐᓂᒃ (delta AIC), ᓂᕈᐊᕈᑎᒋᑦᓱᒋᑦ ᐊᐅᓚᓂᑦᓯᐊᕙᐅᓂᖅᐹᓂᒃ ᓈᒻᒪᑦᑐᓂᒃ. ᐊᐅᓚᓂᐅᖁᑦ ᐊᖏᖅᑕᐅᖁᑦ ᓈᒻᒪᓈᖅᓯᒪᑦᓯᐊᖅᐸᑕ ᐊᑏᑎᕐᑲᕐᓂᖕᒋᑦ (Chi Square), ᐊᓚᒡᒐᐃᓐᖕᒋᑦᑐᖅ Kolmogorov-Smirnov ᖃᐅᔨᓴᕐᓂᖅ, ᐊᒻᒪᓗ ᐊᓚᒡᒐᐃᓐᖕᒋᑦᑐᖅ Cramer-von Mises ᖃᐅᔨᓴᕈᑎ (Buckland et al. 2001, 2004).

3.0 ᖃᐅᔨᓴᐅᑦ

ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᖃᖓᑕᔪᔪᑦ ca. 377 ᐃᑲᕐᕋᐃᑦ (ᐱᖃᓯᐅᑎᑦᓱᑎᒃ ᓂᐅᓯᒋᐊᖅᑐᖅᑐᑦ) ᐊᑯᓐᖓᓐᓂ ᒫᑦᓯ 27 ᐊᒻᒪᓗ ᒪᐃ 27, 2012. ᖃᐅᔨᓵᕙᐅᔪᑦ ᐊᒻᒪᓗ ᖃᖓᑕᓂᓪᓚᓇᐅᔪᑦ ᑕᑯᔅᓴᐅᑎᑕᐅᔪᑦ ᑎᑎᖅᑑᔭᖅᓯᒪᔪᓂ 3a ᐊᒻᒪᓗ 3b, ᑖᒃᑯᓇᓂ. ᖃᖓᑕᔪᔪᒧᑦ 27,250 km ᖃᐅᔨᓴᕙᑎᓐᓂ, ᐱᒋᐊᖅᓱᑕ ᓂᒋᕐᒥᒃ ᐅᐊᓐᓇᒧᑦ ᐃᖏᕐᕋᑦᓱᑕ. ᖃᐅᔨᓴᕙᐅᔪᖅ ᐱᖃᓯᐅᔾᔨᑦᓱᑎᒃ ᐊᐅᔪᐃᑦᑐᖃᓐᖏᓐᓂᖏᓐᓂ ᓂᒋᐊᑕ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᖃᕙᖓᑕ ᕿᑭᖅᑖᓗᒻᒥ, ᐊᒻᒪᓗ ᖃᓂᒋᔭᖏᓐᓂ ᕿᑭᖅᑕᓱᓂ (ᑎᑎᖅᑐᕙᒃ 1 ᐊᒻᒪᓗ ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 3b). ᑕᓱᐅᔭᕐᔪᐊᑉ ᐃᑭᕋᓴᖓᓂ, Mill ᕿᑭᖅᑕᒥ, ᑐᔾᔭᕌᕐᔪᓐᓂ, ᑐᔾᔮᓂ, ᐃᓘᓐᓇᑎᒃ ᐃᓗᐊᓃᑦᑐᑦ ᐅᒃᑯᓯᒃᓴᓕᐅᑉ ᓇᑎᕐᓇᖓᑕ ᐃᒻᒥᒃᑯᐊᖅᑎᕐᓂᖓᓂ, ᑎᑭᑕᐅᒍᓐᓇᔪᓐᖏᑦᑐᑦ ᐃᒪᖅ ᐱᔾᔪᑕᐅᓪᓗᓂ ᓯᓚᕐᓂᓗᓪᓗ. ᐅᑭᑦᑐ ᐊᓲᓈ, ᐊᖑᓇᓱᑦᑎᓄᑦ ᑲᑎᒪᔨᐅᖃᑕᐅᔪᖅ ᑭᓐᖓᕐᓂ, ᐅᖃᕐᒥᔪᖅ ᖃᐅᔨᒪᔭᐅᓐᖏᒋᐊᖓ ᑐᑦᑐᖃᖅᓯᒪᒻᒪᖑᑕ ᕿᑭᖅᑕᐃᑦ, ᐅᐸᒋᐊᑭᓐᖏᓐᓂᑯᖏᓐᓄᑦ (Jenkins et al 2012). ᑭᓯᐊᓂᓕ, ᑐᓴᕋᓴᐃᑦ ᐊᕐᕌᒍᒥᒃ ᐊᑕᐅᓯᐅᓐᖏᑦᑐᒥᒃ ᓇᓄᕐᓂᒃ ᖃᐅᔨᓴᓂᐅᔪᓂᒃ, ᖁᓛᒎᓖᓪᓗ ᖁᓚᐅᖃᑦᑕᖅᓯᒪᓂᖏᓐᓂᒃ ᐅᖃᖅᓯᒪᔪᑦ ᑐᑦᑐᓂᒃ ᑕᑯᓴᖅᑕᖃᖅᓯᒪᓐᖏᒋᐊᖓ 2009-2012−ᒧᑦ. (ᒥᓂᒃᑕᐅᕙᖓᑦ ᐊᕙᑎᓕᓇᔾᑯᑦ, ᑎᑎᕋᖅᑕᐅᓯᒪᓐᖏᑦᑐᑦ ᑲᑎᖅᓱᖅᓯᒪᔪᑦ).

ᐃᒡᓗᓕᖅᐸᓯᐅᑉ ᒥᑦᓵ, Koch ᕿᑭᖅᑕᖅ ᐊᒻᒪᓗ Rowley ᕿᑭᖅᑕᖅ ᐅᐸᑦᑕᐅᒍᓐᓇᔪᓐᖏᒻᒥᔪᑦ ᑖᒃᑯᐊᓴᐃᓐᓇᐃᑦ ᐱᔾᔪᑕᐅᓪᓗᑎᒃ. ᑐᓐᖓᕙᒋᑦᓱᒋᑦ ᓄᓇᓕᓐᓂᒃ ᐊᐱᖅᓱᕐᓂᐅᓯᒪᔪᑦ, Rippin (1972) ᐅᖃᖅᓯᒪᔪᑦ ᑐᑦᑕᕐᑲᓐᖏᒋᐊᖓ ᐊᕙᑎᒃᑭᓐᓂ ᕿᑭᖅᑕᐃᑦ. ᐊᒻᒪᓗ, ᓇᓄᕐᓂᒃ ᖃᐅᔨᓴᖅᓱᑎᒃ 2009-2010, ᐊᒻᒪᓗ 2012-ᒥ, ᑐᑦᑐᑕᕐᑲᔪᓐᖏᑦᑐᖅ ᑐᑦᑐᑕᓚᐅᖅᓯᒪᔫᔭᕋᓂᓗ Koch ᐅᕝᕙᓗ Rowley ᕿᑭᖅᑕᖏᓐᓂ. (ᒥᓂᒃᑕᐅᖕᕙᖓᑦ ᐊᕙᑎᓕᓇᔾᑯᑦ, ᑎᑎᕋᖅᑕᐅᓯᒪᓐᖏᑦᑐᑦ ᑲᑎᖅᓱᖅᓯᒪᔪᑦ). ᑖᒃᑯᐊ ᓄᓇᓪᓚᑑᔪᑦ ᐃᓚᒍᑦᓯᐅᔾᔭᐅᓯᒪᓐᖏᑦᑐᑦ ᕿᒥᕈᔭᐅᔪᓂ ᐃᓚᒍᑦᓯᐅᔾᔭᐅᐸᑕ ᒥᑭᓪᓕᕚᓪᓕᕈᑕᐅᒐᔭᖅᓱᑎᒃ ᐃᓘᓈᒧᑦ ᑐᑦᑐᖃᕐᓂᐅᔪᓄᑦ ᕿᑭᖅᑖᓗᒻᒥ ᑐᑦᑐᑕᖃᓐᖏᓐᓂᑯᖓᓄᑦ (ᑕᑯᓗᒍ ᑎᑎᖅᑐᕙᒃ 1). ᐊᑕᖏᑲᓴᑦᓯᐊᖅᑐᖅ ᐊᒥᐊᒃᑯ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐋᒡᒐᒐᓛᑐᐊᑦ ᐃᓄᐃᓴᑦᑐᑦ ᑐᑭᓕᐊᖅᑐᑦ ᑲᔪᓯᓯᒪᓐᖏᑦᑐᑦ ᑕᑦᑐᖅ ᐱᔾᔪᑕᐅᓪᓗᓂ, ᖃᓄᐃᓐᓂᖏᓐᓄᓪᓗ ᐃᓅᓕᖓᐃᑦ, ᐊᒻᒪᓗ/ᐅᕝᕙᓗ ᐸᑐᐃᑦ (ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 3b). ᖃᐅᔨᓴᕐᓂᐅᔪᒧᑦ ᐊᐅᓚᓂᐅᔪᖅ ᑭᖑᕙᓇᐊᖅᑕᐅᓯᒪᔪᔪᖅ ᓂᓇᐅᓇᖅᓯᒪᓐᖏᓐᓂᖓᓄᑦ ᓯᓚᕐᓂᓪᓗ ᑭᖑᕙᐅᖅᑲᒍᑕᐅᑦᓱᓂ ᐱᒋᐊᕙᑦᓴᒥᒃ ᐅᓪᓗᕐᒥᒃ (ᒫᑦᓯ 16 ᒫᑦᓯ 27−ᒧᓄᑦ), ᖃᐅᔨᓴᕋᓱᐊᖅᓱᑎᒃ (ᐅᓪᓗᐃᑦ 1-5), ᐊᒻᒪᓗ ᐊᑐᐃᓐᓇᐅᓂᖓ ᐊᑕᐅᓯᖅ ᖁᓛᒎᓕᐅᑉ ᓂᑯ ᕿᑭᖅᑕᒥ ᓄᓇᓕᒋᔭᐅᔪᓄᑦ (12 ᐅᓪᓗᐃᑦ). ᐅᔾᔨᕐᓇᕐᒥᔪᖅ, ᐊᐃᑉᐸᖓ ᖁᓛᒎᓕᐅᑉ ᐱᓕᕆᖃᑎᒌᖏᑦ ᓄᓈᕈᓐᓇᔪᒻᒪᑕ ᑲᔪᓯᒋᐊᕈᓐᓇᖅᓱᑎᓪᓗ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᑕᕝᕙᓂ. ᓄᓇᒥ ᐃᖅᑲᓇᐃᔾᔪᔪᑦ ᑲᔪᓯᔪᔪᑦ ᒪᐃ ᓄᓐᖑᐊᓄᓄᑦ ᑐᑦᑐᐃᑦ ᓄᑦᑕᕐᓂᖏᑦ ᕿᑐᕐᖏᐅᕙᓐᓄᑦ ᖃᐅᔨᒪᔭᐅᓂᖓᓄᑦ (ᐃᓂᖃᖅᑐᖅ ᖃᐅᔨᓴᖅᑕᐅᔫᑉ ᐃᓗᐊᓂ; Ferguson 1995) ᕿᑐᕐᖏᐅᕙᐅᕙᒋᐊᖓ (Jenkins et al. *in prep*, Ferguson 1989, Redhead ᐊᒻᒪᓗ Land 1979, Elliot ᐊᒻᒪᓗ Elliot 1975, Elliot ᐊᒻᒪᓗ Elliot 1974). ᐊᐅᓚᔾᔭᒋᐊᕈᑕᐅᑦᓱᑎ ᑭᖑᕙᐅᖅᑲᒍᑕᐅᑐᐃᓐᓇᓇᐊᓕᓐᓄᑦ, ᑲᔪᓯᑎᑕᐅᔪᓂᖓ ᖃᑲᐅᔨᓴᕐᓂᐅᑉ ᐸᕐᓇᑕᐅᓯᒪᔪᔪᖅ ᓂᒋᕐᒥᒃ ᐅᐊᓐᓇᒧᑦ, ᓵᕐᓗ ᐊᖅᑯᑎᖓᓐᓄᑦ ᓄᑦᑕᖅᑐᑦ (Ferguson 1989, Redhead ᐊᒻᒪᓗ Land 1979, Elliot ᐊᒻᒪᓗ Elliot 1975, Elliot ᐊᒻᒪᓗ Elliot 1974). ᑕᒪᓐᓇ ᖃᐅᔨᓴᑦᓯᐊᕈᑕᐅᔪᔪ ᕿᑐᕐᖏᐅᕚᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᖏᓐᓂ ᐃᓱᓕᑦᓯᓕᖅᑎᓪᓗᒍ ᓄᓇᒥ ᐊᐅᓚᓂᐅᔪᖅ ᐊᒻᒪᓗ ᓄᑦᑕᖅᑐᑦ ᐆᒪᔪᐃᑦ ᓈᓴᖅᑕᐅᑦᓱᑎᒃ. ᑭᖑᓪᓕᖅᐹᒥ ᖃᐅᔨᓴᕐᓂᐅᑉ ᐱᕙᓪᓕᐊᓂᖓᓴᖓ

ᓄᑦᑕᖅᑐᓄᑦ ᐊᖅᑯᑕᐅᔫᑉ ᓱᑲᓐᓂᖅᓴᐅᔪᔪᖅ (ca. 40-50 km/ᐅᓪᓗ) ᖃᐅᑕᒫᑦ ᓄᑦᑕᕐᓂᖏᓐᓂᒃ ᑐᑦᑐᐃᑦ (ᓅᒐᔪᑦᓯᑎᒃ 2.26 km/ᐅᓪᓗ, SE 149 m; ᓂᕆᐊᓂ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᓂᒃ ᖁᖓᓯᕐᒥᐅᑕᓕᖅᑐᐃᓂᕐᒥᒃ ᑲᑎᖅᓱᖅᑕᐅᔪᑦ; ᒪᐃ 1987–1991; Jenkins et al, *in* prep).

3.1 ᑕᒃᓴᐅᔪᑦ--. ᖃᐅᔨᓴᕐᕕᐅᑉ ᐃᓗᐊᓂ, ᑎᑎᕋᖅᓯᒪᔪᒍᑦ 185–ᓂᒃ ᑕᑯᓂᐅᔪᓂᒃ ᑐᑦᑐᓂᒃ ᑲᑎᒪᐅᖅᑐᓂᒃ ᑕᒪᒃᐲᓐᓂ ᖃᐅᔨᓴᕐᕕᒻᒥ ᓯᓚᑖᓃᓗ; ᑕᑯᔅᐅᑎᑦᓯᑦᓯᑎᒃ 518–ᓂᒃ ᐃᒻᒥᒃᑐᖅᑐᓂᒃ (2-3–ᖑᒐᔪᑦᓯᑎᒃ ᑲᑎᒪᔪᑦ), ᖃᑦᓯᑐᐃᓐᓇᕐᓂᒃ ᐊᕐᕌᒍᕐᑲᖅᓯᑎᒃ. ᑐᒦᑦ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ 83–ᖏᕋᖅᓯᑎᒃ ᐊᒻᒪᓗ 4 ᓂᕆᕖᑦ ᐅᔾᔨᕆᔭᐅᑦᓯᑎᒃ (ᑎᑎᖅᑐᕐᕕᒃ 2). ᐋᖅᑭᑦᓯᒪᓂᖏᑦᑎᒍᑦ, ᐃᓅᕋᑖᓂᒃ ᓄᕋᓂᒃ ᑕᑯᔪᕐᑲᔪᓐᖏᑦᑐᖅ ᖃᐅᔨᓴᕐᓂᖅ ᐱᔭᕇᔪᒻᒪᑦ ᕿᑐᕐᖏᐅᓚᐅᖅᑎᓐᓇᒋᑦ. ᖃᐅᔨᕐᓴᐅᓂᔪᓄᑦ ᐊᐅᓚᓂᔪᑦ ᐊᐅᓚᔅᓴᐃᓯᒪᔪᑦ 143–ᓂᒃ ᑕᑯᓂᐅᔪᓂᒃ 324–ᓂᒃ ᑐᑦᑐᓂᒃ (ᐊᕐᕌᒍᑕᓐᓂᒃ ᐅᖓᑖᓂᓘᓐᓃᑦ) ᖃᐅᔨᓴᕐᕕᐅᔪᒥ. ᐃᓗᓕᖏᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ ᐃᒻᒥᒃᑰᖅᑐᑦ ᑲᑎᑦᓯᑎᒃ 155 ᐊᕐᓇᐃᑦ, 94 ᐊᖑᑏᑦ ᐸᓐᓃᑦ, 72 ᐊᕐᕌᒍᑏᑦ, ᐊᒻᒪᓗ 34 ᓄᕋᐃᑦ (ᖃᐅᔨᒪᔭᐅᒻᒥᔪᑦ ᐊᕐᕌᒍᑕᓐᓂᒃ). ᓇᓗᓇᐃᔭᖅᓯᒪᔪᑦ ᐊᑐᐃᓐᓇᐅᑎᑕᐅᔪᑦ ᑎᑎᖅᑐᕐᕕᒻᒥ 3. ᓄᕋᐃᑦ 9.6%–ᖑᔪᑦ ᑕᒃᓴᐅᔪᓂ ᐆᒪᔪᕐᓂ ᐅᕝᕙᓗ 22 ᓄᕋᐃᑦ ᐊᑐᓂᑦ 100 ᑐᑦᑐᐃᑦ ᐊᕐᓇᐃᑦ. ᐊᖑᑏᑦ ᐊᒦᓯᓂᖅᓴᐃᑦ ᐊᕐᓇᐃᑦ ᐃᒫᑎᒍᑦ 61:100.

3.2 ᕿᓂᕐᓂᐅᔪᓂᒃ ᕿᒥᕐᕈᓂᖅ --.ᕿᒥᕐᕈᕆᐊᓐᖓᕐᓃᑦ ᐅᖓᓯᓐᓂᓕᓐᓂᒃ 6.0 ᑕᑯᔅᐅᑎᑦᓯᓯᒪᔪᑦ ᑲᑎᖅᓱᐃᓂᕐᒧᑦ ᐊᑲᐃᓪᓕᐅᕈᑎᑕᕐᑲᓐᖏᑦᑐᓂᒃ ᐅᕝᕙᓗ ᐱᔭᕆᐊᑐᔪᖅᑕᕐᑲᕋᑎᒃ, ᐃᓯᒪᕆᕐᑲᓯᐅᑎᑦᓯᕆᑦ ᕿᒫᓂᖏᑦ ᑐᑦᑐᐃᑦ ᐅᕝᕙᓗ ᖃᐅᔨᔭᐅᑐᐃᓐᓇᓂᐊᕐᑲᕐᓂᖏᑦ ᖃᖓᑕᔫᓄᑦ ᐃᖏᕋᕕᐅᔪᓄᑦ < 1. ᓇᓪᓕᑐᐃᓐᓇᖏᑦ ᑖᒃᑯᐊ ᐱᑕᕐᑲᓐᖏᑦᑐᑦ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᓂ. ᕿᓂᕐᓂᐅᔪᓂᒃ ᕿᒥᕐᕈᓂᖅ ᑕᑯᔅᐅᑎᑦᓯᔪᖅ ᐃᓚᖏᑦ ᑐᑦᑐᕐᑲᕐᕕᐅᔪᑦ ᑕᑯᔅᐅᑎᑕᐅᓐᖏᑐᐊᕆᐊᖏᑦ. ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᑕᐅᓕᖅᓯᒪᒻᒥᔪᑦ. ᐱᓗᐊᖅᑐᒥᒃ ᐊᖏᓈᖅᓯᒪᓂᖅᓴᓄᑦ: ᒪᓂᕋᑦᑐᖅ (F) =0, ᐊᒻᒪᓗ ᖃᖅᑲᐃᑦ (H) ᐊᒻᒪᓗ ᐃᓐᓈᕈᐃᑦ (M) = 1, ᐊᒻᒪᓗ ᒥᑭᓈᕐᓂᖅᓴᓄᑦ ᒪᓂᕋᑦᑐᖅ (1) = 0, ᐊᒻᒪᓗ ᓯᑑᖓᔪᖅ (2) ᐊᒻᒪᓗ ᐃᓐᓈᕈᔾᔮᐸᓗᒃ (3) = 1, ᒪᓂᕋᑦᑐᑦ ᒪᓃᑦᑐᓪᓗ ᑐᑦᑐᕐᑲᕐᕕᐅᔪᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᓯᒪᓪᓚᕆᒻᒪᑕ (Pearson's r=0.96, Fisher's ᑖᓐᓇᓪᓗᐊᖅ ᖃᐅᔨᓴᐅᑎᖓ, p<0.0001), ᐊᑕᐅᓯᑐᐊᖅ ᐊᐅᓚᓂᐅᔪᖅ ᐃᓯᒪᕆᔭᐅᕐᑲᑦᑕᔪᔪᖅ ᐊᑕᐅᓯᐅᓈᖅᓯᑎᒃ.

3.3 CDS ᐊᒻᒪᓗ MCDS ᖃᐅᔨᔭᐅᔪᓄᑦ ᐊᐅᓚᓂᐅᔪᑦ --. ᐱᕐᑲᓯᐅᑎᑦᓯᑎᒃ ᒪᓂᑦᑐᑦ ᒪᓂᕋᑦᑐᓪᓗ ᑐᑦᑐᕐᑲᕐᕕᐅᔪᓂ ᐊᐅᓚᓂᐅᔪᓂ ᑕᑯᔅᐅᑎᑦᓯᓯᒪᔪᑦ ᐊᖏᔪᐊᓗᒻᒥᒃ ᐱᕚᓪᓕᖅᓯᒪᓂᐅᔪᒥᒃ ᐊᐅᓚᓂᕐᒧᑦ (delta AIC) CDS–ᖑᓯᒪᔪᓂ. ᑐᓐᖓᕕᖏᑦᓯᕆᑦ delta AIC, ᓂᕈᐊᖅᓯᒪᔪᒍᑦ ᐊᕝᕙᖏᓐᓂᒃ ᐊᐅᓚᓂᐅᒐᔪᑦᑑᑉ ᐱᐅᓂᖅᐸᐅᕆᐊᖓ (ᑎᑎᖅᑐᕐᕕᒃ 4, ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 4). ᑖᓐᓇ ᐊᐅᓚᓂᐅᔪᖅ ᓈᒻᒪᓈᖅᓯᒪᒻᒪᑦ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᓄᑦ (ᐱᐅᓂᖏᑦ ᖃᐅᔨᓴᕈᑕᐅᔪᑦ; 2=17.7411, *p*=0.12378, Dn=0.0665, p=0.5615, and W^2=0.1762, 0.300<p<=0.400). ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᑕᑭᓂᐅᑉ ᓯᕗᑐᓂᖓ 1,036 m (95% CI 886-1,211 m). ᓂᕆᐅᕆᔭᐅᔪᑦ ᑲᑎᒪᐅᖅᑐᑦ ᐊᖏᓂᖏᑦ 2.13 (95% CI 1.91 – 2.38) ᑲᑎᒪᐅᖅᑐᑦ ᐊᖏᓂᖓᑦ 2.26 (95% CI 2.02 - 2.51)–ᖑᑦᓯᑎᒃ ᑐᑦᑐᐃᑦ ᑲᑎᒪᐅᖅᑐᑦ. ᓇᓚᐅᑦᓵᖅᓯᒪᔪᒍᑦ ᖃᐅᔨᔭᐅᔪᑦ ᑐᑦᑐᐃᑦ ᓇᓗᓇᐃᔭᖅᓴᐅᓯᒪᔪᒥ ᓄᓇᒥ

Pa=0.37 (95% CI 0.32 - 0.43–ᖑᒋᐊᖏᑦ). ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᑲᑎᒪᔪᑦ ᑐᑦᑐᐃᑦ 0.0053 caribou/km^2 ᐅᑯᐊ 5.3 ᑐᑦᑐᐃᑦ ᐊᑐᓂᑦ 1,000 km^2 (95% CI 3.8 - 7.4/1000 km^2). ᑐᓐᖓᕕᒋᑦᓱᒋᑦ ᖃᐅᔨᓴᕈᑦ ᖃᐅᔨᓴᕝᕕᐅᔪᒥ (ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ, 279,233.701 km^2), ᓇᓚᐅᑦᓵᔪᔪᑦ 1,484 ᑐᑦᑐᓂᒃ ᐊᕐᕌᒍᓕᓐᓂᒃ ᐊᑕᐅᓯᕐᒥᒃ ᐅᖓᑖᓂᓘᓐᓂᑦ (95% CI 1,065 - 2,067; CV 0.17). ᐱᓗᐊᖅᑕᐃᓕᑦᓱᒍ, ᕿᒥᕐᕈᓂᐅᔪᖅ ᐃᓚᒍᑦᓯᐅᔾᔨᓯᒪᓐᖏᑦᑐᖅ ᐊᕐᕌᒍᓕᓐᓂᒃ ᐊᖏᓪᓕᕚᓪᓕᕈᑕᐅᒐᔭᖅᑐᓂᒃ ᓇᓚᐅᑦᓵᖅᑕᐅᔪᓄᑦ. ᐊᒻᒪᓗ, ᖃᐅᔨᕐᓂᐅᔪᖅ ᐱᔭᕇᖅᑕᐅᔪᑦᓱᓂ ᕿᑐᕐᖏᐅᓚᐅᖅᑎᓐᓇᖏᑦ ᑕᐃᒪᐃᓐᓂᖓᓄᑦ ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᓐᖏᑦᑐᖅ ᐊᒥᓲᓂᖏᑦ 2012–ᒥ. ᓇᓚᐅᑦᓵᖅᑕᐅᔪᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᔪᖅᑎᒍᑦ, ᐊᑐᐃᓐᓇᐅᑎᑕᐅᔪᑦ ᑎᑎᕋᕝᕕᒃ 5–ᒥᒃ.

4.0 ᐅᖃᖃᑎᒌᓐᓂᐅᔪᑦ

4.1 ᐊᒥᓲᓂᖏᓐᓂᒃ ᓇᓚᐅᑦᓵᕐᓂᖅ --.ᐃᓘᓐᓈᒍᑦ, ᖃᖓᑕᔪᔪᑦ ᐅᖓᑖᓂ, 27,000 km ᖃᐅᔨᓴᕝᕕᑎᓐᓂ ᑕᑯᑦᓱᑕᓗ 143 ᑲᑎᒪᐅᖅᑐᓂᒃ ᑐᑦᑐᓂᒃ (ca. 5 ᑲᑎᒪᐅᖅᑐᑦ ᐊᑐᓂᑦ 1,000 km ᑎᒻᒥᕖᐅᔪᑦ). ᒫᑦᓯ–ᒪᐃ 2012-ᒧᑦ, ᓇᓚᐅᑦᓵᖅᓯᒪᔪᒍᑦ 95%–ᒥᒃ ᓇᓗᓐᖏᓯᖅᑐᕐᓂᖃᖅᓯᑕ ᐊᑯᓐᓂᐅᔪᓂ, ᐊᑯᕐᖓᓐᓂ 1,065 ᐊᒻᒪᓗ 2.067 ᑐᑦᑯᐃᑦ (ᐊᕐᕌᒍᓖᑦ ᐊᑕᐅᓯᕐᒥᒃ ᐅᖓᑖᓂᓘᓐᓅᑦ) ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ ᐊᑐᖅᓯᑕ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᕈᑕᐅᔪᓂᒃ. ᐃᓄᐃᓴᑦᑐᑦ ᑕᑯᔭᐅᓯᒪᔪᑦ, ᐃᓂᖃᖅᓯᒪᔪᑦ ᐊᖏᔪᐊᓗᒻᒥ ᓄᓇᒥ ᑕᑯᒃᓴᐅᑎᑦᓯᑦᓱᑎᓪᓗ ᖃᓄᐃᓕᖓᖏᓐᓂᒃ ᑐᑦᑐᐃᑦ ᐊᒥᓲᓂᖏᑦᑕ, ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᑦᓱᑎᒃ ᐊᖏᓈᕐᓂᖅᓴᖓᑑᐃᓐᓇᐅᑦᓱᑎᒃ Peary ᑐᑦᑐᓂᒃ ᕿᖓᐅᒻᒥ (0.0095 ᑐᑦᑐᐃᑦ/km^2; 2001) ᐊᒻᒪᓗ ᐅᐊᓐᓇᖓᓂ ᑲᓇᓐᓇᖓᓂᓗ ᐊᐅᔪᐃᑦᑑᑉ ᕿᑭᖅᑕᖓᑕ (0.0083 ᑐᑦᑐᐃᑦ/km^2; 2006 ᐊᒻᒪᓗ 0.0092 ᑐᑦᑐᐃᑦ/km^2; 2005, ᑖᒃᑯᓇᓂ; Jenkins et al. 2011). ᖃᐅᔨᔪᔪᑦ ᑐᑦᑐᐃᑦ ᓂᒋᐊᓂ ᕿᑭᑦᑖᓘᑉ ᐃᓄᐃᓴᓈᖅᓯᒪᑦᓱᑎᒃ ᑲᑎᒪᐅᓇᐊᖏᑦ (ᒪᕿᕖᓴᔪᑦᑑᒃ, ᑎᑭᐅᒪᑦᓱᑎᒃ 1-16) ᑕᐃᒪᐃᒻᒥᔪᑦ ᐊᓯᖏᑦ ᑐᑦᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᐅᓯᒪᔪᑦ ᕿᑭᖅᑖᓘᒻᒥ ᐅᑭᐅᖑᑎᓪᓗᒍ (ᑕᑯᓗᒍᖏᑦ Jenkins et al. 2011, Jenkins ᐊᒻᒪᓗ Goorts 2011, Jenkins 2010, 2009). ᑕᑯᓐᓇᖅᓱᒍ ᐃᓗᓕᖅᑐᓂᖓ, ᖃᓂᒌᑦᑐᓂᒃ ᐊᑯᓐᓂᖃᕋᓱᐊᖅᓱᑕ, ᒥᑦᓯᖃᖅᑐᖅ ᓂᕈᐅᓐᓂᖃᕈᑦᑕ ᑭᒡᓚᖅᑐᐃᑦᓯᐊᖅᑐᓂᒃ ᑐᑦᑐᓂᒃ ᑕᑯᔪᖃᖅᓯᒪᒋᐊᖓ. ᐊᑕᖏᑦᓯᐊᖅᑐᒥᒃ ᓈᓴᐃᓂᖅ ᓄᓇᐸᐅᓻᓗᒻᒥ ᐊᔪᓇᑦᓯᐊᕐᒪᑦ ᑕᐃᒪᐃᓐᓐᖓᓄᑦ, ᐅᖓᓯᑦᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᖅ ᐊᑐᖅᑕᐅᓯᒪᔪᖅ ᓯᕗᑐᔪᒥᒃ ᖃᐅᔨᓴᕐᓂᖃᕐᑯᓪᓗᒋᑦ ᑖᒃᑯᓇᓂ ᑐᑦᑐᖃᑦᓯᐊᖏᑦᑐᓂ. ᑕᑯᓐᖏᓐᓂᖅ ᑐᑦᑐᓂᒃ ᐊᑑᑎᓂᐅᓴᑐᐃᓐᓇᖅᑐᖅ ᖃᐅᔨᓴᕝᕕᐅᔪᓂ (ᐊᒻᒪᓗ ᓂᕈᐅᒋᔭᐅᑦᓱᑎᒃ), ᑭᓯᐊᓂ ᐊᐅᓚᓂᕐᒧᑦ ᐋᖅᑭᑦᓯᒪᓂᐅᔪᖅ ᖃᐅᔾᒪᒃᑲᓐᓂᕈᑕᐅᒍᓐᓇᖅᑐᖅ ᖃᐅᔭᐅᒍᓐᓇᕐᓂᖏᓐᓂᒃ.

ᐊᖑᑕᐅᓂᖏᓐᓄᑦ ᐊᕐᓇᐅᓂᖏᓐᓄᑦ ᐊᕐᕌᒍᖏᓐᓄᑦᓗ ᑕᑯᔭᐅᔪᑦ ᑖᑯᓂ, ᑐᑭᓕᐅᕆᓂᖅ ᐱᔭᕆᐊᑐᔪᖅ ᑕᐃᒫᑦᑕᐅᖅ ᑐᑭᓯᓇᓱᐊᕐᓂᖅ ᐊᑯᓐᓂᕆᔭᐅᔪᓂᒃ ᐱᓯᒪᒻᒪᑕ ᐅᑭᐊᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᐅᔪᓂᒃ ᐊᓯᖏᓐᓂᒃ ᑐᑦᑐᓂᒃ ᑲᑎᒪᐅᖅᑐᓂᒃ ᐊᒻᒪᓗ ᐱᕽᔪᑕᐅᑦᓱᓂ ᐊᒥᓲᖏᓐᓂᖏᑦ ᑐᑦᑐᐃᑦ ᕿᑭᖅᑖᓗᒻᒥ.
ᑕᐃᒪᐃᖓᓗᐊᖅᑎᓪᓗᒍ ᓈᓴᐅᑏᑦ 22 ᓄᕋᐃᑦ ᐊᑐᓂ 100 –ᓄᑦ ᐊᕐᓇᓄᑦ, ᖃᐅᔨᓴᖅᑕᐅᕗᑦ ᐅᕙᓂ, ᑕᐃᒪᐃᓕᖓᒍᔪᑦᑐᑦ ᑲᑎᒪᐅᖅᑐᑦ ᐃᓄᐃᓴᑦᑐᓂ ᐊᒻᒪᓗ/ᐅᑯᐊ ᐃᓄᐃᓴᓪᓕᕚᓪᓕᐊᔪᓂ (ᓱᕐᓗ Peary ᑐᑦᑐᐃᑦ).

ᖃᓄᐃᓕᖓᓂᐅᔪᓄᑦ ᐅᓂᒃᑳᑦ ᓄᓇᕐᓯᐊᕐᒥ, ᐆᒪᔪᐃᑦ ᐅᓗᕆᐊᓇᒃᑐᒦᑦᑐᑦ ᑲᑎᒪᔩᑦᓛᖏᑦ). ᐊᒻᒪᓗ ᖁᕐᓯᑦᑐᒻᒪᕇᑦ ᐊᕐᕌᒍᓖᑦ ᑕᑯᓐᓇᖅᓱᒋᑦ ᐃᓐᓇᐃᑦ, ᑕᐃᒪᐃᑎᑕᐅᒍᓐᓇᖅᑐᑦ ᐊᖑᔭᐅᖃᑦᑕᕐᓂᖏᓐᓄᑦ ᐃᓐᓇᐅᑎᖏᑦᑕ ᐊᒻᒪᓗ/ᐅᖁᓗ ᕿᑐᙱᐅᑦᓯᐊᕐᓂᖅ ᐊᕐᕌᒍᒥ. ᓄᓇᓕᓐᓂᒃ ᑐᑭᓯᓂᐊᕐᓂᐅᔪᑦ ᐃᓕᒋᐊᕈᑕᐅᓂᐊᖅᑐᑦᖅ ᐃᓗᓕᖏᓐᓄᑦ ᑖᒃᑯᐊ ᖃᐅᔨᔭᐅᓯᒪᔪᑦ.

4.2 ᕿᒥᕐᕈᓂᖅ ᐊᐅᓚᓂᐅᔪᓂᒃ ᓂᕆᐅᒋᔭᐅᔪᓂᒃ --.ᖃᐅᔨᓴᕐᓂᐅᑉ ᐊᖅᑭᒃᓯᒪᓂᖓ, ᐱᖃᓯᐅᑎᑦᓱᓂ ᐊᐅᓚᓂᑦᓴᖓ ᐸᕐᓇᑕᐅᓯᒪᑦᓯᐊᔪᔪᖅ, ᐊᐅᓚᖕᔨᒋᐊᕈᑕᐅᑦᓱᑎᒃ ᓂᕆᐅᒋᔭᐅᔪᑦ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ, ᓴᖅᑮᓗᑎᒃ ᓇᓚᐅᑦᓵᖅᑕᐅᓂᖏᓐᓂᒃ ᑲᑎᒪᐅᖅᑐᑦ, ᐊᒻᒪᓗ ᖃᐅᔨᕐᓴᕕᐅᔪᑦ ᖁᓚᐅᑕᐅᓗᑎᒃ ᑲᔪᓯᓗᑎᒃ ᐅᑭᐅᒃᑯᑦ (ᑕᑯᓗᒍ ᐊᑖᓃᑦᑐᖅ). ᓯᕗᓪᓕᕐᒥ, ᐋᖅᑭᑦᓯᒪᓂᐅᔪᖅ ᓱᖏᖅᑑᑎᕐᑲᔪᔪᖅ ᖃᖓᑕᒐᔭᕆᐊᑦᓴᖅ ᐊᖏᓈᖅᓯᒪᔪᓂ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᓂ ᖃᐅᔨᓴᕐᕕᑦᓴᓂ ᐃᓗᐊᓂ ᖃᐅᔨᖅᑕᐅᓂᐊᖅᑑᑉ ᑖᒃᑯᐊᓗ ᖃᖓᑕᕕᐅᑦᓯᐊᖅᓯᒪᑦᓱᑎᒃ, ᐋᒡᒐᒐᖀᒐᓗᐊᖅ ᓇᐃᓈᖅᓯᒪᔪᑦ ᕿᑭᖅᑕᕋᓈᓃᑦᑐᑦ ᖃᓂᑦᑐᓂ. ᒥᑭᓂᖏᖅ ᕿᑭᖅᑕᐃᑦ ᐊᒻᒪᓗ ᑲᑎᖅᓱᖅᑕᐅᔪᑦ ᐱᕕᐅᔪᓂᒃ ᓇᓗᓇᐃᖅᓯᔪᑦ ᑐᑦᑯᐃᑦ ᐱᑕᕐᑲᖅᓯᒪᓐᖏᒋᐊᖏᑦ ᑖᒃᑯᓇᓂ. ᑕᐃᒪᐃᒐᓗᐊᖅᑎᓪᓗᒍ, ᐃᓂᒋᔭᐅᔪᑦ ᕿᑭᖅᑕᓄᑦ ᐃᓚᒍᑦᓯᐅᑎᓯᒪᓐᖏᑦᑐᑦ ᖃᐅᔨᓴᕐᓂᐅᔫᑦ, ᐊᑉᐸᐃᓪᓕᑎᑦᓯᒐᔭᖅᑐᒧᑦ ᓇᓚᐅᑦᓵᖅᑕᐅᔪᓂᒃ ᖃᐅᔨᔭᐅᔪᕐᑲᓐᖏᓯᐊᒻᒪᕆᑉᐸᑦ.

ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐊᐅᓚᓂᐅᔪᖅ ᑭᖑᕙᕆᐊᖅᑕᐅᓯᒪᔪᖅ ᓂᕆᐅᓇᓐᖏᑦᑑᕐᑲᑦᑕᖅᓯᒪᓂᖓᓄᑦ ᓯᓚ ᑭᖑᕙᐅᖅᑲᒍᑕᐅᓯᒪᒻᒪᑦ ᖃᐅᔨᓴᕐᓂᒧᑦ ᐊᐅᓚᓂᖓᓄᑦ ᓄᓇᒥᓐᓂᕐᒧᑦᓗ ᑲᔪᓯᑦᓱᓂ ᒪᐃ ᓅᖑᐊᓄᓄᑦ ᑐᑦᑐᐃᑦ ᓄᑦᑕᕐᓂᖏᑦ ᕿᑐᙱᐅᕝᕙᓐᓄᑦ (ᐃᓗᐊᓃᑦᑐᑦ ᖃᐅᔨᕐᓴᕕᐅᑉ) ᖃᐅᔨᔭᐅᔪᑦ ᐊᑑᑎᖃᑦᑕᕆᐊᖏᑦ ᐃᓚᖏᓐᓄᑦ ᐆᒪᔪᐃᑦ (Jenkins et al. *in prep*, Elliot ᐊᒻᒪᓗ Elliot 1975, 1974). ᑭᓯᐊᓂᓕ, ᐊᐅᓚᖕᔨᒋᐊᕈᑎᒋᓗᒍ ᑭᖑᕙᕈᑕᐅᔪᓄᑦ, ᑲᔪᓯᑎᑦᓯᓂᖅ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐸᕐᓇᑕᐅᓯᒪᔪᔪᖅ ᓂᒋᕐᒥᒃ ᐅᐊᓐᓇᒧᑦ, ᑐᕌᖓᑦᓱᑎᒃ ᓄᑦᑕᕝᕙᐅᔪᒧᑦ (Ferguson 1989, Redhead ᐊᒻᒪᓗ Land 1979, Elliiot ᐊᒻᒪᓗ Elliot 1975, Elliot ᐊᒻᒪᓗ Elliont 1974). ᑕᒪᓐᓇ ᖃᐅᔨᓴᑦᓯᐊᕈᑕᐅᔪᔪᖅ ᕿᑐᙱᐅᕝᕙᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᑦᓯᐊᕋᓗᐊᕐᒪᙶᑕ ᐃᓱᓕᑦᓯᓕᖅᑎᓪᓗᒍ ᓄᓇᒦᓐᓂᖅ ᓄᑦᑕᖅᑐᓪᓗ ᐆᒪᔪᐃᑦ ᓈᓴᖅᑕᐅᑦᓱᑎᒃ. ᑭᖑᓪᓕᖅᐹᒥ, ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐊᐅᓚᓂᐅᔪᖅ ᓄᑦᑕᖅᑐᑦ ᐊᖅᑯᑖᓂ ᓱᑲᓐᓂᖅᓴᐅᔪᔪᑦ (ca. 40-50 km/ᐅᓪᓗ) ᖃᐅᑕᒫᑦ ᓄᑦᑕᕐᓂᖏᓐᓂᒃ ᕿᑭᖅᑖᓗᑉ ᓂᒋᐊᓂ ᑐᑦᑐᐃᑦ (ᓅᓐᓂᐅᕙᔪᑦᑐᖅ 2.26 km/ᐅᓪᓗ, SE 149 m; ᐱᓯᒪᔪᑦ ᕿᑭᖅᑖᓘᑉ ᓂᒋᐊᓂᒃ ᑐᖅᑐᓂᒃ ᖁᖓᓯᕐᒥᐅᑕᓕᖅᑕᐅᓯᒪᔪᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᔪᓂᒃ; ᒪᐃ 1987-1991; Jenkins et al. *in prep*). ᓇᓗᓇᐃᖅᓯᔪᒍᑦ ᐅᖓᓯᑦᑐᒧᑦ ᓄᑦᑲᕐᓂᐅᔪᓂᒃ ᑮᑕᑲᐃᓐᓇᐅᑎᓪᓗᒍ ᐊᔪᕐᓇᖅᓯᒪᓐᖏᑦᑐᑦ, ᕿᒥᕐᕈᑲᓐᓂᕐᓂᕐᓗ ᐊᑐᐃᓐᓇᐅᔪᓂᒃ ᑲᑎᖅᓱᖅᓯᒪᔪᓂᒃ ᐊᑑᑎᕙᓪᓕᐊᔪᖅ ᐊᖏᓪᓕᕚᓪᓕᑲᓐᓂᕐᑯᓪᓗᒍ ᑐᑭᓯᓯᒪᓂᕗᑦ. ᐱᓗᐊᖅᑐᒥᒃ, ᓄᓇᓂᒃ ᑲᑎᖅᓱᖅᑕᐅᓯᒪᔪᑦ ᓂᒋᐊᓄᑦ ᕿᑭᖅᑖᓘᑉ ᐊᐳᖅᓯᒪᒻᒪᑕ 1987-1994−ᒧᑦ, ᑐᑦᑐᐃᑦ ᐊᒥᓱᓂᖅᓴᑉᐹᓱᓯᒪᑎᓪᓗᖏᑦ ᒫᓐᓇ ᓇᓚᐅᑦᓵᖅᓯᒪᔭᑦᑎᓐᓂᒃ (Jenkins ᐊᒻᒪᓗ Goorts 2013, Jenkins et al. 2012, Ferguson ᐊᒻᒪᓗ Gauthier 1992). In 2012, ᖃᐅᔨᔪᔪᖏᑦ ᐊᒥᓲᖏᑦᑐᐹᓗᓐᓂᒃ ᓄᑦᑕᕐᕕᐅᑉ ᐊᖅᑯᑎᖓᓂ ᑐᑦᑐᓂᒃ ᓄᑦᑕᓗᐊᖏᑦᑐᖓᓂᒃ ᐅᖁᓗ ᐃᓄᐃᓴᑦᑑᑎᐹᓗᓐᓂᒃ. ᑖᒃᑯᐊ ᖃᐅᔨᔭᐅᔪᑦ ᐃᑲᔪᖅᓯᔭᐅᔪᑦ ᐃᓄᐃᑦ ᖃᐅᔨᒪᔭᖏᑦᑎᒍᑦ ᐊᒥᖅᑲᐅᑕᐅᔫᒃᑯᑦ ᓄᓇᓕᓐᓂ ᑐᑦᑐᓂᒃ ᖃᐅᔨᒪᔫᒪᓇᐅᔪᓄᑦ ᓴᓐᑏ ᐋᑲᕙᒃ, ᑯᓗᒑ ᐱᑦᓯᐅᒑ, ᑕᒪᕐᒥᒃ ᑭᒻᒥᕈᒻᒥᐅᒃ (Jenkins et al. 2012).

ᓵᓐᑏ ᐋᑲᕙᒃ ᐅᖃᖅᑐᖅ *“ᐊᑖᑕᒐ ᐃᓄᑐᖃᐅᓂᖅᓴᐃᑦᑐ ᐅᖃᖃᑦᑕᔪᔪᑦ ᑐᑦᑐᖃᖠᐅᔪ17 ᑐᑦᑐᕐᓯᐊᕙᖅᑲᓇᐊᖏᑦ ᑐᑦᑐᖃᐃᓐᓇᓰᑦ. ᐊᑖᑕᑯᑦ ᐅᖃᖃᑦᑕᔪᔪᑦ ᐃᓚᖓᓂ ᑐᖅᑐᐃᑦ ᐃᓄᐃᓯᑦᓕᕙᑦᓕᕋᐃᒻᒪᑕ ᓄᑦᑕᕈᓐᓃᓯᑦ, ᑕᖕᕙᓂᕐᓴᐃᓐᓈᓯᓰᑦ. ᑕᒪᓇ ᓯᕗᓕᑦᑎᓐᓂ ᑐᓴᐅᒪᔪᕗᑦ ᐊᑖᑕᑦᑎᓐᓂᓪᓗ. ᐃᑉᐱᒋᓯᒪᔪᕋ ᐊᕐᕌᒍᓂ ᐊᓂᒍᖅᑐᓂ, ᓄᓇᒥ ᐃᓚᖓᓂ ᓯᓇᑦᑲᓐᖏᑦᑐᖅ ᑭᓯᐊᓂ ᐊᓯᖏᓐᓂ ᑐᑦᑐᖃᐃᓐᓇᓰᖅ, ᓯᓚ ᑕᐃᑲᓃᑦᑐᑦ – ᑕᐃᑲᓂᑐᐊᖅ ᓄᑦᑕᕈᓐᓃᖅᓯᑎᓪᓗ (ᐊᒥᓰᓂᖅᓴᐅᓕᕋᐃᕕᒃ ᓄᑦᑕᓂᖅᓴᐅᓰᑦ).”* ᓯᓚᒃᑲᓂᖅ, ᑯᓗᓛ ᐱᑦᓯᐅᓛᖅ ᐅᖃᖅᑐᖅ *“ᐃᓄᐃᓯᑦᓕᕙᑦᓕᕋᐃᒻᒪᑕ, ᓄᑦᑕᖅᑑᔮᕈᓐᓃᓰᑦ. ᕿᑐᖕᖏᐅᖠᒻᒥ ᓴᓂᐊᓃᓐᓂᖅᓴᐅᔫᔮᓕᓰᑦ.”* ᑕᒪᒃᑯᐊ ᑐᓴᕋᓗᐊᖅᓯᑎᒍ ᓯᓚᒃᑲᓂᖅ ᑐᕿᓯᓂᐊᕐᓂᖅᑕᖅᑲᒃᑲᓂᖏᐊᖅᑲᖅᒪᑦ ᖃᐅᔨᓴᕐᓗᒋᑦ ᑖᒃᑯᐊ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᔪᑦ, ᑕᒪᓇ ᐅᖃᕈᓇᖅᒪᑦ ᑐᑦᑐᐃᑦ ᑲᑎᒪᐅᖅᑐᑦ ᐅᕚᓗ ᓯᐊᒻᒪᕐᓯᒪᓂᖅᓴᐃᑦ, ᑐᑦᑐᖅᑦᓯᖅᑲᖏᑦᑐᑦᑑᑦᑐᑦ ᐃᓄᐃᓯᑦᓕᒋᐊᒃᑲᓂᒪᓇᑦᓯᑎᒃ. ᑕᐃᒪᐃᑲᓗᐊᖅᑎᓪᓗᒍ, ᑐᖅᑐᐃᑦ ᓅᑉᐸᓪᓕᐊᔪᒥᓂᐅᑐᐃᓐᓇᓇᐊᓖᑦ ᑖᕗᖓᓴᐃᓐᓇᖅ ᑐᕿᖅᓯᑎᒃ ᖃᐅᔨᓴᖅᓯᖅ ᐱᕙᓪᓕᐊᑎᓪᓗᒍ, ᓱᑲᓂᖅᓴᐅᓗᑎᓪᓗ ᖃᐅᔨᓴᕐᓂᐅᑉ ᐃᖏᕋᓂᖕᖓᓂᒃ, ᓈᓴᖅᑕᐅᒃᑲᓂᖅᓯᑎᒃ ᑐᑦᑐᐃᑦ.

ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᓂᖅ ᓂᕆᐅᒍᑕᐅᒪᑦ ᐆᒪᔪᐃᑦ ᖃᐅᔨᓴᐅᓰᖑᒋᐊᖏᑦ ᐃᓂᒋᔭᖏᓐᓂᒃ ᓇᒧᐃᓐᓇᖅ ᕿᓂᕐᓂᖅᑕᖅᑲᖏᓐᓂᖓᓂ (ᓰᕐᓗ ᓅᑉᐸᓪᓕᐊᔪᑦ ᖃᐅᔨᓴᖠᐅᔪᒥᒃ). ᑕᐃᒫᒃ ᓅᑉᐸᓪᓕᐊᔪᓂᖏᑦ ᑲᑎᖕᖏᑦᑐᖃᕋᔭᖅᐸᓚᐃᖏᑦᑐᖅ ᓱᒃᑲᐃᓐᓂᖏᓐᓄᑦ ᑐᑦᑐᐃᑦ ᖁᓚᑰᓛᑦ ᓴᓂᐊᓂ, ᑭᓯᐊᓂᑦᑕᐅᖅ ᖃᐅᔭᓴᐅᓂᖏᓐᓄᑦ ᖃᐅᔨᓴᖠᒥᒃ ᑲᔪᐅᓴᕋᐃᑉᐸᑕ ᑐᑦᑐᐃᑦ. ᓄᓇᒥ ᑲᔪᓐᖏᑦᑐᒍᑦ ᑐᑦᑐᓂᒃ ᐸᖓᓕᑦᑐᓂᒃ ᕿᒫᓗᑎᒃ ᖁᓛᒎᓕᒻᒥᒃ ᑭᓯᐊᓂ ᐅᖓᓯᓐᓂᖅᓯᑕ ᖃᓂᒋᔮᓗᐊᓄᑦ ᖃᐅᔨᓴᖠᐅᑉ ᑐᑭᓕᐊᕐᓂᖓᑕ. ᑕᐃᒪᐃᑦᑎᓪᓗᒍ, ᐊᐳᑎᑕᓕᒃ ᑲᑦᓴᐅᑎᑦᓯᒍᑕᐅᓪᓚᓇᔪᔪᖅ (ᓰᕐᓗ ᑐᒦᑦ ᓄᑖᑦ) ᐊᑐᖅᑕᐅᔪᑦ ᓇᓗᓇᐃᖅᓯᒍᑕᐅᑦᓯᑎᒃ ᐃᓂᒋᔭᖏᓐᓂᒃ ᖃᐅᔨᓴᐅᕆᐊᖕᖓᖅᑐᑦ. ᑭᖑᓪᓕᖅᐹᒥ, ᖃᐅᔨᓴᖅᑕᐅᓂᖅ ᐅᖓᓯᓐᓂᐅᔪᓂᒃ ᑲᑎᓯᖅᑕᐅᔪᑦ ᑲᑦᓴᐅᔪᖅᑲᔪᖕᖏᑦᑐᑦ ᓯᖁᒥᑦᓯᓂᖅᒥᒃ ᑕᒪᑦᓯᒥᖓ ᓂᕆᐅᒋᔭᐅᔪᒥᒃ.

ᒪᓕᑦᓯᒪᔾᔪᑦ Marques et al. 2006 ᑲᒪᒋᐊᕈᑎᒋᓯᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓂᒃ ᓂᕆᐅᒋᔭᐅᔪᓂᒃ, ᐱᓗᐊᖅᑐᒥᒃ, ᐅᖓᓯᓐᓂᓕᒻᒥᒃ ᕿᑎᖓᓂᒃ ᐊᑐᓂᑦ ᖃᐅᔨᔭᐅᔪᑦ ᑲᑎᒪᐅᖅᑐᑦ ᖃᐅᔨᓴᖅᑕᐅᑦᓯᐊᐸᓪᓕᖓᒫᑕ ᐊᑐᓂᑦ ᖃᐅᔨᓴᖠᐅᔪᓂ. ᑕᐃᒪᐃᒻᒪᑦ, ᓱᖏᖅᑑᑎᖃᖅᓯᒪᔪᒍᑦ ᓯᕗᖕᖓᓂ ᖃᐅᔨᓴᕐᓂᐅᓯᒪᔪᓂᒃ ᐊᑐᖅᓱᑕ GIS–ᒥᒃ ᓇᓗᓇᐃᕈᑎᒋᓱᒍ ᐅᖓᓯᓐᓂᖏᓐᓂᒃ ᑲᑎᒪᐅᖅᑐᑦ ᑐᑭᓗᐊᖅᑐᓗᑦ ᑲᑐᓇᖅᓱᒋᑦ ᐃᖏᕋᓂᖏᑦ ᖁᑖᒎᓕᑦ ᐊᒻᒪᓗ ᑕᑉᐸᐅᓇ ᑕᒻᒪᓅᒃᑯᑎᑎᒍᑦ ᐃᓂᒋᔭᖏᑦ ᑐᑦᑐᐃᑦ ᑲᑎᒪᐅᖅᑐᑦ ᑲᑎᒪᐅᖅᑐᓂᒃ ᑕᑯᒋᐊᖕᖑᖠᒪᑕ. ᐊᑐᖅᓯᑎᒃ ᑖᒃᑯᓇᖕᖑᑦ ᒪᓕᒋᐊᓕᓐᓂᒃ ᑕᒻᒪᖅᑐᖃᖕᖏᓂᐅᓴᑐᐃᓐᓇᓇᐊᖑ.

ᐊᓚᒡᒐᐃᑐᐊᖑᐊᓂᖅᐸᐅᔪᖅ ᓂᕆᐅᒋᔭᐅᔪᓂᒃ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᒥᒃ ᐆᒪᔪᐃᑦ ᐱᑕᖃᓲᖑᒻᒪᑕ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ ᖃᐅᔨᔭᐅᑦᓯᑎᓪᓗ, (ᓲᕐᓗ g (0) = 1). ᖃᐅᔨᓴᕐᓂᓪᒧ ᑐᓐᖓᕕᐅᔪᖅ ᐅᑭᐅᒃᑯᓪᓗ ᐊᐅᓚᓂᐅᔪᖅ ᐋᖅᑭᑦᑕᐅᓯᒪᔪᑦ ᓈᒻᒪᓈᕆᐊᖅᓱᑎᒃ ᑕᕝᕙᖓ. ᐅᖅᑲᖅᑐᒍᑦ ᑐᑦᑐᐃᑦ ᑕᑯᔭᐅᓐᖏᑦᑑᒐᔭᓐᖏᒋᐊᓐᖏᑦ ᑐᑦᑐᐃᑦ ᐊᖏᔫᒻᒪᑕ, ᐆᒪᔪᐃᑦ ᑕᖅᑳᓂ ᑕᑯᑦᓴᒦᓲᑦ, ᓇᐹᖅᑐᖃᓐᖏᑦᑐᒥ, ᐊᒻᒪᓗ ᐊᐳᑎ ᑕᑯᑦᓴᐅᑎᑦᓯᑦᓯᐊᖅᓱᓂ ᖃᑯᕐᒥ ᐊᒻᒪᓗ ᑐᑦᑐᖅᑕᐅᕋᑖᖅᑕᖅᑲᖅᐸᑦ (ᓲᕐᓗ ᑐᒦᑦ ᓂᕆᕚᑦᓗ). ᐱᓗᐊᖅᑐᒥᒃ, ᐱᕙᓪᓕᐊᓂᖅ ᖃᐅᔨᓴᕐᕕᐅᔪᒥ ᐱᒋᐊᖅᓯᒪᔪᖅ ᓂᒋᕐᒥᒃ ᐅᐊᓐᓇᒧᑦ (70° N), ᐊᐳᑎᖃᐃᓐᓇᖅᓱᓂᓗ. ᑕᐃᒪᐃᒻᒪᑦ ᖃᐅᔨᓴᕐᓂᕆᓯᒪᔭᕗᑦ, ᓇᓗᓇᓐᖏᓯᖅᑐᖅᓱᓂ ᑐᑦᑐᐃᑦ ᖁᓚᐅᑦᓯᒪᔭᕗᑦ ᑕᑯᔭᐅᓐᖏᑦᑑᓯᒪᓐᖏᒻᒪᑕ, ᒥᑦᓯᖃᖅᐸᑦ. ᐱᒻᒪᕆᐅᔪᖅ, g (0) ᒥᑭᓂᖅᓴᐅᓐᓂᕋᓗᐊᖅᐸᑦ 1−ᒥᒃ, ᓄᐊᑕᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᓪᓗ ᓱᓕ ᓇᓗᓇᐃᕈᑎᑦᓴᐃᑦ ᐃᓄᐃᓴᓐᓂᖅᓴᐅᓕᕆᐊᖏᑦ ᓂᕆᐊᓂ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᐃᑦ ᓇᓚᐅᑦᓵᖅᑕᐅᒋᐊᓐᖓᖅᓯᒪᔪᓂᒃ. ᓲᕐᓗ ᑕᑯᔭᐅᓐᓂᖏᑦᑐᑦ 50% ᑐᑦᑐᐃᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ ᑐᑭᓗᐊᖅᑐᒥ (ᓲᕐᓗ ᐱᔾᔪᑕᐅᓪᓗᓂ ᓯᓚ ᒪᓃᑦᑐᕐᔫᓐᓃᑦ) ᒪᕐᕈᐊᑎᓪᓗᐊᑎᑦᓯᒐᔭᖅᑐᖅ ᐊᒥᓲᓂᖏᑦᑕ ᓇᓚᐅᑦᓵᖅᑕᐅᓂᖏᓐᓂᒃ ca. 3000 ᐆᒪᔪᐃᑦ.

ᐊᐅᓚᓂᐅᔪᖅ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᐅᔪᖅ ᐆᑦᑐᕋᖅᑕᐅᔪᔪᖅᐊᖏᓂᖓᓄᑦ ᓄᓇᐅᑉ ᓄᓇᐸᐅᔭᐅᓂᖓᓄᑦ ᑐᑦᑐᑭᓐᓂᖓᓗ. ᑲᒪᒋᐊᕈᑕᐅᑦᓯᓂ heterogeneity−ᒥᒃ, ᐊᑐᖅᓱᑕ ᐃᓂᒋᔭᐅᔪᓂᒃ ᖃᐅᔨᓴᓂᕐᒥ, ᐊᒻᒪᓗ ᐃᓚᒍᑦᓯᐅᔾᔨᓂᕐᒥᒃ covariates. 18ᐱᔾᔪᑕᐅᔪᖅ ᐃᓚᖓ, ᐃᓚᖏᓐᓄᑦ ᒥᑭᓅᖅᓯᒪᔪᑦ ᖃᐅᔨᔭᐅᔪᑦ ᐃᓚᖏᓐᓂ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ, ᐃᓚᒍᑦᓯᐅᔾᔨᓂᖅ ᑐᑦᑐᖃᕐᕕᐅᔪᑦ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ covariate−ᖑᑎᓪᓗᒋᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐱᒻᒪᕆᐅᓯᒪᔪᑦ. ᓯᕗᓂᑦᑎᓐᓂ, ᓱᓕᒃᑲᓐᓂᖅ ᐊᔾᔨᒌᓐᖏᑦᑐᑦ, ᒪᑯᐊ ᓯᓚ, ᐊᐳᑎᖃᕐᓂᖅ, ᐊᒻᒪᓗ ᖃᐅᔨᓴᖅᑎ, ᐃᓱᒪᒋᔭᐅᖃᓯᐅᑎᓂᐊᕐᒥᔪᑦ. ᑕᐃᒪᐃᒐᓗᐊᖅᑎᓪᓗᒍ, ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᒫᓐᓇ ᐊᑐᐃᓐᓇᐅᔪᑦ ᐅᓂᒃᑳᖑᔪᓂ ᖃᐅᔨᒪᓕᑕᐅᕗᑦ ᐊᐅᓚᑦᓯᖅᑎᒌᓐᓂᕐᒧᑦ.

4.3 ᖃᓄᐃᔾᔪᑕᐅᔪᑦ --.ᐃᓘᓐᓈᒍᑦ, ᑕᑯᓐᓇᖅᓯᒍ ᐱᔭᕆᐊᑭᓐᖏᑦᑐᖅ ᐊᐅᓚᓂᐅᔪᖅ, ᖃᐅᔨᓴᕐᓂᒧᑦ ᐋᖅᑭᑦᓯᒪᓂᐅᔪᖅ ᐆᑦᑐᕋᕐᓂᕐᓗ. ᐅᖃᖅᐳᒍᑦ ᓇᓚᐅᑦᓵᕐᓂᖅ ᖃᓄᓐᖏᑦᓯᐊᖅᑐᖅ ᖃᐅᔨᔭᕗᓪᓗ ᑐᓐᖓᕕᖃᑦᓯᐊᖅᓯᑎᒃ ᑐᓴᐅᒪᔭᐅᔪᓂᒃ ᓄᓇᓕᓕᓐᓂᒃ (Jenkins et al. 2012, Jenkins ᐊᒻᒪᓗ Goorts, 2013). ᐃᓗᓕᖅᑐᔪᓂᒃ ᑐᑭᓯᓂᐊᕐᓂᖅ ᐊᖑᓇᓱᑦᑏᑦ ᑲᑎᒪᔨᖏᓐᓂᒃ ᓅᕙᐃᕝᕙ-ᑏᓴᕝᕙ 2011, ᔮᓐᓄᐊᕆ-ᕕᕗᐊᕆ 2012, ᐊᒻᒪᓗ ᑏᓴᕝᕙ 2012 ᓇᓗᓇᐃᖅᓯᓯᒪᔪᑦ ᐊᖑᓇᓱᑦᑏᑦ ᐅᖓᓯᓐᓂᖅᓴᒧᑦ ᐃᖏᕐᕋᒋᐊᖅᑲᕆᐊᖏᑦ ᑐᑦᑐᓯᐅᕆᐊᕐᓗᑎᒃ (ᔪᐊᓇᓯ ᑯᓂᓕᐅᓯ, ᐃᓄᑐᖃᖅ, ᕿᑭᖅᑕᕐᔪᐊᖅ, Jenkins et al 2012−ᒥ), ᐃᓄᐃᓴᒋᐊᖏᓪᓗ, ᑐᑦᑐᑕᖅᑲᕈᓂ ᐱᖅᑯᓯᑐᖃᖅᑎᒍ18 ᐊᖑᓇᓱᕝᕕᐅᕙᑦᑐᓂ (ᔪᐊᓇᓯ ᑯᓂᓕᐅᓯ; ᓵᓐᑏ ᐋᑲᕙᒃ, ᑭᒻᒥᕈᑦ; ᕿᒻᒥᐊᑖ ᓄᖑᑦᓯᐃᑦᑐ, ᑭᓐᖓᐃᑦ; Jenkins et al 2012). ᐊᒻᒪᓗ ᐅᑯᓇᓂ ᑐᑭᓯᓂᐊᕐᓂᐅᔪᑦ ᑎᑎᕋᖅᓯᒪᔪᑦ ᐃᓄᐃᓴᓪᓚᓯᒪᒋᐊᖏᑦ ᑐᑦᑐᐃᑦ ᓄᓇᐸᐅᔫᓗᓐᓂ, ᐅᖃᐅᓯᖃᖅᓯᑎᓪᓗ ᑕᑯᓯᒪᓂᕐᒥᒃ ᑐᖁᖓᔪᓂᒃ ᑐᑦᑐᓂᒃ 2008-2010 ᐊᑦᑐᐊᔪᓄᑦ ᓯᑯᓂᕐᒧᑦ (ᔪᐊᓇᓯ ᑯᓂᓕᐅᓯ, ᕿᑭᖅᑕᕐᔪᐊᖅ Jenkins et al. 2012).

ᑭᒥᕿᔾᔪᑎᓪᓴᓂᒃ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᓂᒃ ᐱᑕᖃᙱᓚᕿ, ᓇᓄᓇᐃᖅᓱᒍᓇᙱᑦᑐᒍᑦ ᒫᓇᐅᔪᖅ ᐊᐅᓚᓂᙱᓐᓂᒃ ᐊᒥᓲᓂᙱᑦᑕ. ᑮᓯᐊᓂᓕ, ᐃᓄᐃᑦ ᖃᐅᔨᒪᓂᑐᖃᙱᑦ ᓇᓄᓇᐃᖅᓯᔪᑦ ᑐᑦᑐᐃᑦ ᐃᓄᐃᓴᓪᓕᕙᓪᓕᐊᔪᒥᓂᐅᑐᐃᓐᓇᕆᐊᓖᓪ 1990–ᙱᓐᓂᓂᑦ ᐊᒻᒪᓗ ᐱᓄᐊᖅᑐᒥᒃ 2000 ᐊᕿᕌᒍᙱᓐᓂ (Jenkins et al 2012). ᑐᓐᖓᕕᑦᓱᑦ ᓯᕗᕐᖓᓂ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᓇᓚᐅᑦᓵᖅᑕᐅᔪᑦ ᐊᓂᙱᑦ (60,000-180,000; Ferguson ᐊᒻᒪᓗ Gauthier 1992), ᖃᐅᔨᔭᕗᑦ ᑕᑯᓪᓴᐅᑎᑦᓯᔪᑦ >95% ᐃᓄᐃᓴᓪᓕᕚᓪᓕᕐᓂᙱᓐᓂᒃ ᐊᒥᓲᓂᙱᑦᑕ. ᑕᐃᒪᐃᒻᒪᕿ, ᐃᓱᒪᓕᐅᕆᕗᒍᑦ ᑐᑭᓯᓂᕐᑲᕐᓂᖅᑕᕐᑲᒻᒪᕆᕐᑯᔨᑦᓱᑕ ᓄᓇᓕᓐᓂᒃ ᐊᒻᒪᓗ/ᐅᕝᕙᓗ ᓄᓇᓕᓐᓂᒃ ᐱᓕᕆᔨᓂᒃ ᐊᐅᓚᑦᓯᓗᑎᒃ ᐱᕙᓪᓕᐊᕐᑲᑎᕐᑲᕐᓂᕐᒥᒃ ᐋᖁᑎᓂᕐᒥᓪᓗ ᐱᓄᐊᑦᑕᐃᓕᒪᓂᕐᒧᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᓪᓗ ᐊᐅᓚᔅᔨᕆᐊᕈᑎᓂᒃ. ᑖᓇ ᐱᕕᓪᓴᕐᑲᕐᓂᐅᓂᐊᖅᑐᖅ ᓄᐊᑦᓯᓂᕐᒥᒃ ᑐᑭᓯᑲᓐᓂᕈᑎᓪᓴᓂᒃ ᖃᓄᐃᓯᒪᔪᕐᑲᕐᒪᙵᖅ 1990–ᙱᓐᓂᓂᑦ ᖃᓄᕐᓗ ᐊᐅᓚᓂᙱᑦ ᑐᑦᑐᐃᑦ ᕿᑭᖅᑖᓗᒻᒥ ᖃᐅᔨᓴᖅᑕᐅᒍᓇᕐᒪᙵᑕ ᑲᒪᑦᔨᐅᓂᙱᓪᓗ. ᐃᓄᐃᑦ ᐱᖅᑯᓯᑐᕐᑲᖅᑎᒍᑦ ᐱᐅᓯᕐᑲᖅᑐᑦ ᒪᓕᒐᕐᑲᖅᓱᑎᓪᓗ ᐋᖁᑎᑐᐃᓐᓇᕆᐊᓕᓐᓂᒃ ᖃᓄᐃᓕᖓᓂᐅᔪᓄᑦ ᐃᓄᐃᓴᓪᓕᕚᓪᖅᓯᒪᔪᓄᕿ, ᑕᒪᒃᑯᐊᓗ ᐃᓱᒪᒋᔭᐅᖃᓯᐅᑎᕆᐊᕐᑲᖅᓱᑎᒃ ᓴᖅᑮᕝᕙᓪᓕᐊᓕᕈᑎᒃ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᑐᓐᖓᕕᓪᓴᒥᒃ (ᓵᓐᑏ ᐋᑲᕝᕕ, ᑭᒻᒥᕈᑦ; ᑯᓄᓛ ᐱᑦᓯᐅᓛᖅ, ᑭᒻᒥᕈᑦ; ᔭᓐᑲᓐᓵ ᐊᑦ ᐃᐅᓪ–ᒥ, 2012). ᑕᒪᓇ ᐊᑦᓱᕈᕐᓇᖅᑐᕗᓗᒃ ᐆᒪᔪᓂᒃ ᐊᐅᓚᑦᓯᔨᓄᑦ ᐊᑦᓱᕉᑎᕐᑲᓪᓚᕆᑦᓱᑎᒃ ᓄᓇᓕᓐᓂ ᕿᑯᓕᓂ ᐊᒻᒪᓗ ᐊᒥᓱᑦ ᑎᒍᒥᐊᖅᑎᐅᔪᑦ ᓴᖅᑮᕆᐊᕐᑲᕐᓂᐊᖅᑐᑦ ᒥᑦᓯᕐᑲᑦᓯᐊᖅᑐᒥᒃ ᐊᒻᒪᓗ ᓈᒻᒪᓈᖅᑐᒥᒃ ᐸᕐᓇᐅᑎᒥᒃ ᑕᒪᒃᑮᓐᓄᑦ ᐱᓄᐊᑦᑕᐃᓕᒪᓂᕐᒧᑦ ᐊᐅᓚᑦᓯᓂᕐᒧᓪᓗ ᑖᒃᑯᓈᖓᑦ ᑐᑦᑐᓂᒃ.

5.0 ᑐᑭᓯᒋᐊᕐᕕᐅᔪᑦ:

ᐋᕐᓴ, ᔭ., ᑎ.ᐊ. ᒪᖅᓴ, ᓴ.ᑎ. ᕙᒃᓚᓐ, ᒪ. ᐋᓐᑐᓴᓐ, ᓴ. ᕙᓕᑲᖕ, ᐊ. ᕗᑦᑐᓈᖕ, ᐊᒻᒪᓗ ᐅ. ᐅᐃᒡ. 2009. ᓇᓚᐅᑦᓵᕐᓂᖅ Barents ᐃᒪᕝᕕᒥ ᓇᓄᕐᑲᕐᕕᐅᔪᓂᒃ. ᐳᐃᔾᓂᒃ ᑐᑭᓯᓂᐊᕐᓂᖅ 25(1): 35-52.

ᕙᒃᓚᓐ, ᓴ.ᑎ., ᑎ.ᕋ. ᐊᓐᑐᓴᓐ, ᑭ.ᐱ. ᕗᓐHᐊᒻ, ᔭ.ᓚ. ᓚᒃ, ᕕ.ᓚ. ᕗᐊᕐᓴᔅ, ᐊᒻᒪᓗ ᓚ. ᑖᒪᔅ. 2004. ᓯᕗᕙᖅᓯᒪᔪᓂᒃ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᖅ. ᓇᓚᐅᑦᓵᕐᓂᖅ ᐊᒥᓲᓂᖏᓐᓂᒃ ᐆᒪᔪᐃ. ᐋᒃᓴᕗᐊᕐᑦ ᓯᓚᑦᑐᓴᕐᕕᔾᔪᐊᕐᒥᒃ ᑐᓴᕋᔅᓴᐃᑦ, ᐋᒃᓴᕗᑦ, ᔪᓇᐃᑎᑦ ᑭᖕᑕᒻ.

ᕙᒃᓚᓐ, ᓴ.ᑎ., ᑭ.ᐱ. ᕗᕐᓐHᐊᒻ, ᔭ.ᓚ. ᓛᒃ, ᑎ.ᓚ. ᕗᐊᕐᓴᔅ, ᐊᒻᒪᓗ ᓚ. ᑖᒪᔅ 2001. ᓇᓗᓇᐃᔭᖅᑕᐅᓂᖏᑦ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᔅᓴᓂᐅᔪᑦ: ᓇᓚᐅᑦᓵᖅᑐᑦ ᐊᒥᓲᓂᖏᓐᓂᒃ ᐆᒪᔪᐃᑦ. ᐋᒃᓴᕗᐊᕐᑦ ᓯᓚᑦᑐᓴᕐᕕᔾᔪᐊᕐᒥ ᑐᓴᕋᔅᓴᐃᑦ, ᓂᐅ ᔪᐊᖅ.

ᑦᓴᐅᓐᔅ, ᑎ. 1979. ᐅᑮᕕᐅᕙᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᖅ, ᕿᑭᖅᑖᓗᒃ ᓂᒋᐊᓂ ᑐᑦᑐᓂᒃ ᑲᑎᒪᐅᖅᑐᓂᒃ, ᔫᕙᐃᕝᕙ 1979. ᓄᓇᓯᐅᑕᓕᕆᓂᖅ ᑎᑎᕋᖅᑕᐅᓯᒪᓐᖏᑦᑐᑦ ᐅᓂᒃᑳᑦ. ᒐᕙᒪᒃᑯᖏᑦ ᓄᓇᕐᓯᐊᖅ, ᔭᓗᓇᐃ.

ᒥᓂᔅᑕᐅᕝᖓᑦ ᐊᕙᑎᓕᕆᔾᔪᑦ, 2005. ᐃᓱᒪᓕᐅᕈᑕᐅᔪᑦ ᑲᑎᑦᓱᑎᒃ ᐊᖑᔭᐅᒍᓐᓇᖅᑐᓂᒃ (TAH) ᖃᑦᓯᐅᓂᖏᑦ ᐱᓱᑦᑏᑦ ᐊᒥᓲᓂᖏᑦᑕ ᓄᓇᕗᒻᒥ, ᒥᓂᔅᑕᐅᕝᖓᑦ ᐊᕙᑎᓕᕆᔾᔪᑦ, ᑏᓴᖒ 2005.

ᐆᒪᔪᐃᑦ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᐱᓕᕆᔩᑦ. 1995. ᑲᓇᑕᓕᒫᒧᑦ ᐆᒪᔪᕐᓅᖓᔪᓄᑦ ᑐᖓᑦᕕᐅᔪᑦ. ᐱᕈᖅᑐᓕᕆᔾᔪᑦ ᐊᒻᒪᓗ Agri-Food ᑲᓇᑕ, ᖃᐅᔨᓴᖅᑏᑦ, ᑐᑦᑕᕐᒥᒃ ᓄᓇᒥᒃ ᐆᒪᔪᕐᓂᑦᑐ ᖃᐅᔨᔅᓱᕐᒧᑦ ᐊᒻᒪᓗ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᑲᓇᑕᒥ, ᐊᕙᓕᕆᓂᕐᒧᑦ ᑐᑦᑕᕐᕖᑦ, Ecozone–ᒥᒃ ᕿᒥᕐᕈᐴᑦ, ᐋᑐᕞ/Hᐅᑦ. ᐅᓂᒃᑳᑦ ᐊᒻᒪᓗ ᑲᓇᑕᐅᑉ ᓄᓇᓐᖑᐊᖓ ᐊᖏᓂᖅᑲᖅᓱᓂ 1:7 500 000–ᒥᒃ.

ᐊᓕᐊᑦ ᕋ.ᓯ. ᐊᒻᒪᓗ ᓯ.ᐃ. ᐊᓕᐊᑦ. 1974. ᕿᑭᖅᑖᓗᒻᒥ ᑐᑦᑐᓂᒃ ᖃᐅᔨᔅᓴᕐᓂᑦᒍ ᐱᕙᓪᓕᐊᓂᕐᒧᑦ ᐅᓂᒃᑳᑦ, ᔫᓂ 10-ᔪᓚᐃ 17, 1974. ᐆᒪᔪᓕᕆᔩᑦ, ᒐᕙᒪᒃᑯᖏᑦ ᓄᓇᑦᓯᐊᑉ, ᓇᐃᓪᓕᑎᖅᓯᒪᔪᑦ ᐅᓂᒃᑳᑦ.

ᐊᓕᐊᑦ ᕋ.ᓯ. ᐊᒻᒪᓗ ᓯ.ᐃ. ᐊᓕᐊᑦ. 1975. ᖃᐅᔨᓴᕐᓂᖅ ᐃᓂᖏᓐᓂᒃ ᓄᑦᑕᕐᓂᖏᓐᓂᓪᓗ ᑐᑦᑐᐃᑦ ᓂᒋᐊᓂ ᕿᑭᖅᑖᓗᑉ, ᔪᓚᐃ 4 – ᐊᐅᒡᒍᓯ 1974. ᐆᒪᔪᕐᓂᒃ ᐊᐅᓚᑦᓯᔩ, ᒐᕙᒪᒃᑯᖏᓐᓂ ᓄᓇᑦᓯᐊᑉ.

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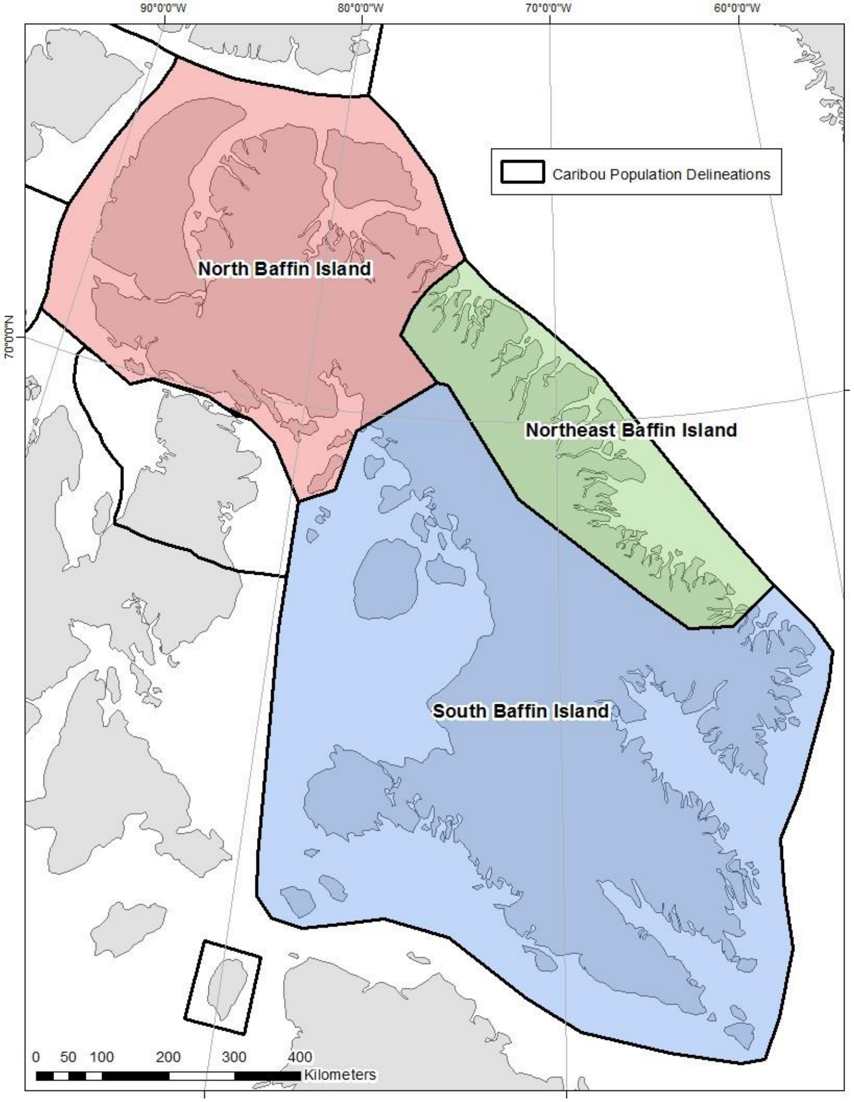
ᑖᒪᔅ, ᓚ. ᓛᒃ, ᔮ.ᓚ. ᕋᒃᔅᑕᑦ, ᐋ. ᓯᑐᕆᖕᕗᑦ, ᓴ. ᒪᒃᓴ, ᕌ..ᕌ.ᓯ., ᕌᒃᓇᓐ, ᓴ.ᑎ. ᕗᐊᕐᓴᔅ, ᑏ.ᓚ., ᐋᓐᑐᓴᓐ, ᑎ.ᕋ. ᕗᕼᐊᒻ, ᑭ.ᐱ., ᕗᕐᑦ, ᒪ.ᓚ., ᕼᐊᑦᓕ, ᓴ.ᓚ., ᐳᓚᕐᑦ, ᔮ.ᕼ. ᕙᓴᑉ, ᔮ.ᕋ.ᕌ ᐊᒻᒪᓗ ᒪᒃᓴ, ᑎ.ᐊ. 2009. ᐅᖓᓯᓐᓂᖅ 6.0 ᓴᒃᑯᑕᐅᔪᖅ 2 ᖃᐅᔨᓴᕐᓂᖓᑦ ᐆᒪᔪᐃ ᐊᒥᖑᓂᖏᑦᑕ, ᓯᓚᑦᑐᓴᕐᕙᔾᔪᐊᖅ ᓴᐃᓐᑦ ᐋᓐᓄᕓᔅᒥ, ᔩᓇᐃᑎᑦ ᑭᖕᑕᒻ,

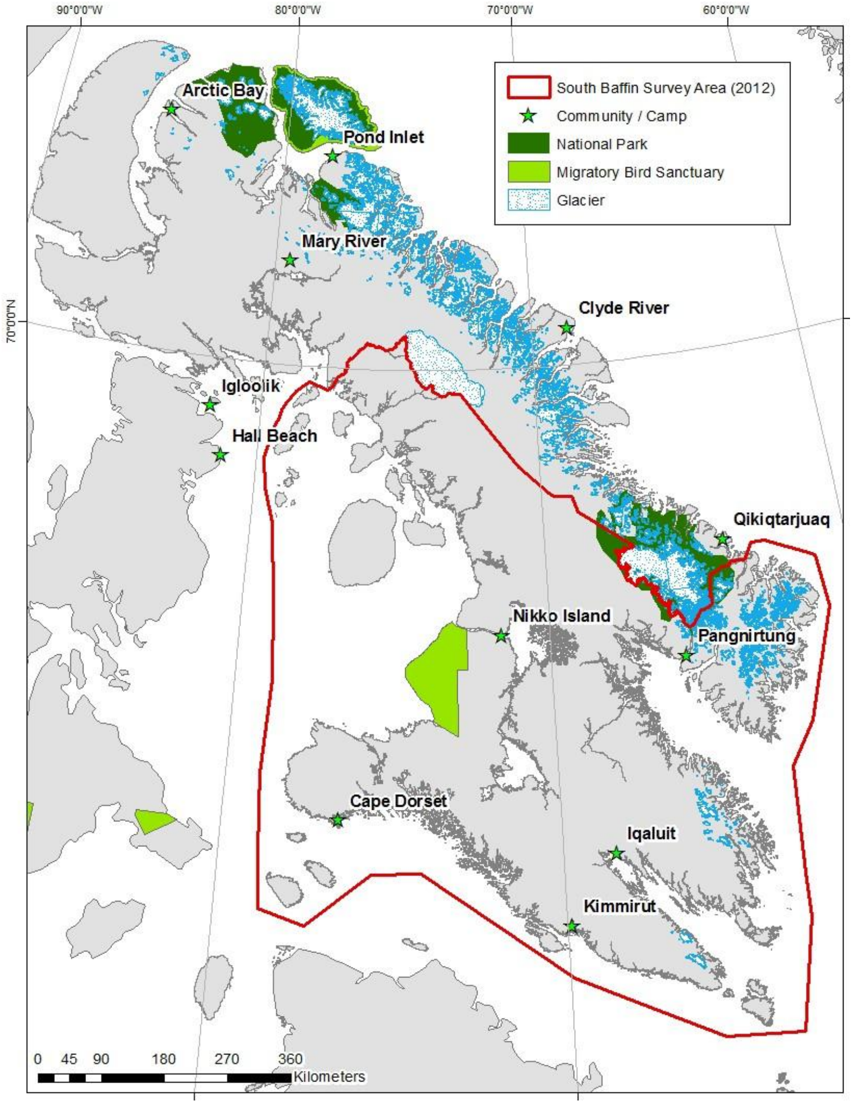
ᐅᐃᓕᐊᒻᔅ ᑕ.ᒪ., ᐊᒻᒪᓗ ᕼᐅᕐᑦ, ᑎ.ᓯ. 1986. ᓄᓇᕐᔪᐊᕐᒥ ᖃᓄᐃᓕᖓᓂᖏᑦ ᑕᖅᑳᓂ ᑲᑎᒪᐅᖅᑐᑦ, Rangifer, ᒪᐅᓇᑐᐃᓐᓇᖅ ᐊᓖᒃᑲᖅᑕᐅᔪᑦ ᐅᕐᑲᓕᒫᒐᐃᑦ ᓈᓴᐅᑎᓖᑦ 1: 19-28.

ᕋᐃᑦ, ᔮ. ᒋ. 1944. ᖃᑭᒪᓇᓱᐊᕈᑎᖅᓴᐃᑦ ᐆᒪᔪᐃᑦ ᑲᓇᑕᒥ ᑲᓇᓐᓇᖓᓂ ᑐᑦᑐᐃᑦ. ᑲᓇᑕᒥ ᐅᓂᒃᑳᓃᑦᑐᑦ, ᐅᑦᑑᕝᕌ: 184-19516

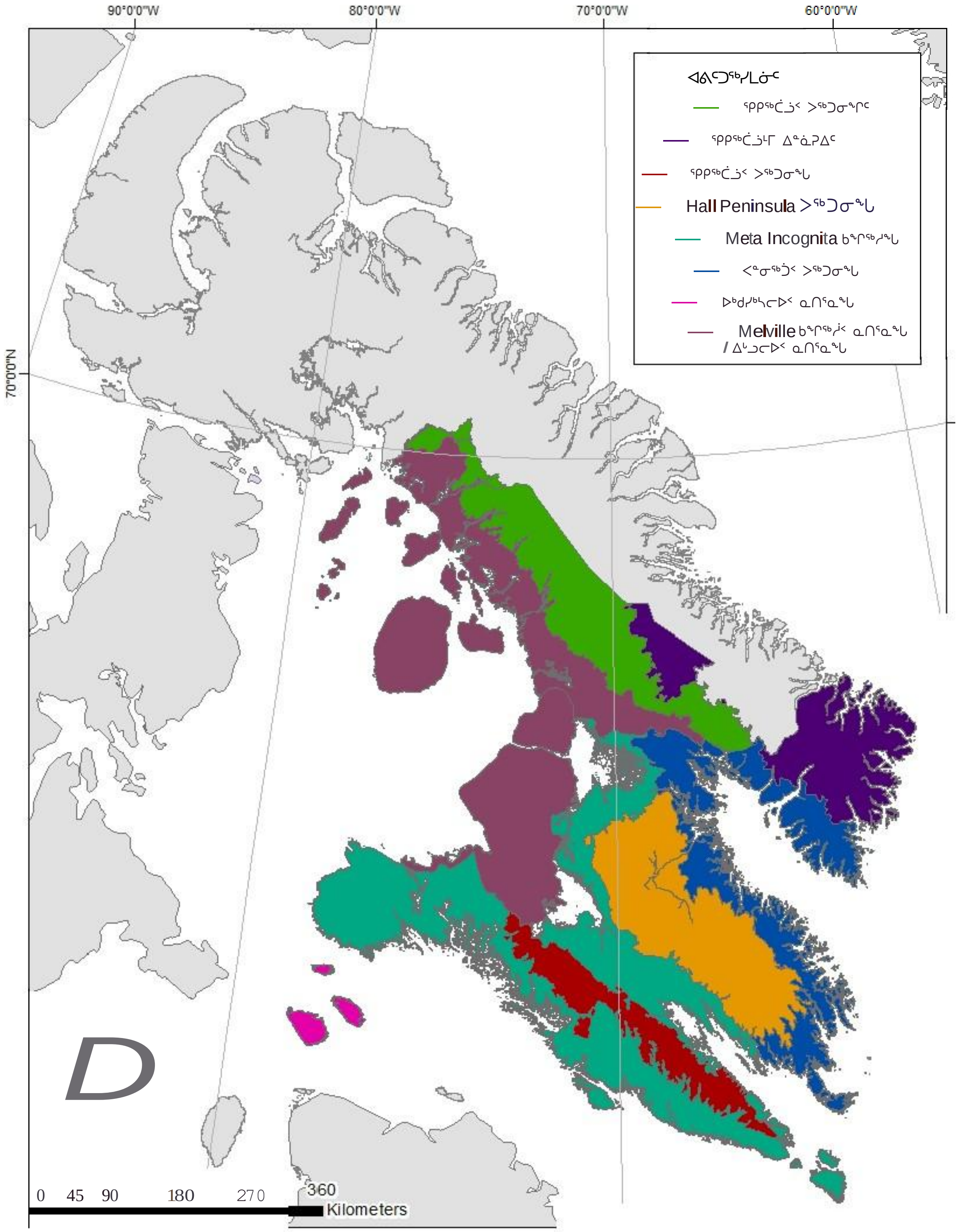
6.0 ᑎᑎᖅᑐᕐᕖᑦ ᑎᑎᖅᑑᔭᖅᓯᒪᔪᑦᓗ



ᑎᑎᖅᑑᓭᖅᓯᒪᔪᖅ 1a. ᖃᐅᔨᓴᖅᑕᐅᕕᖕᒋᑦ Barrenground ᑐᑦᑐᐃᑦ ᕿᑭᖅᑖᓗᒻᒥ, ᑕᐃᒫᒃ ᐃᓕᑕᕆᔭᐅᓯᒪᒻᒪᑕ (ᐋᖅᑭᒋᐊᖅᑕᐅᔪᑦ ᒥᓂᔅᑕᐅᕕᖓᓐᓄᑦ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ 2005).



ᑎᑎᖅᑑᓭᖅᓯᒪᔪᖅ 1b. ᓂᒋᐊᓂ ᕿᑭᖅᑖᓘᑉ ᑐᑦᑐᓂᒃ ᖃᐅᔨᓴᕐᕕᐅᔪᑦ, 2012

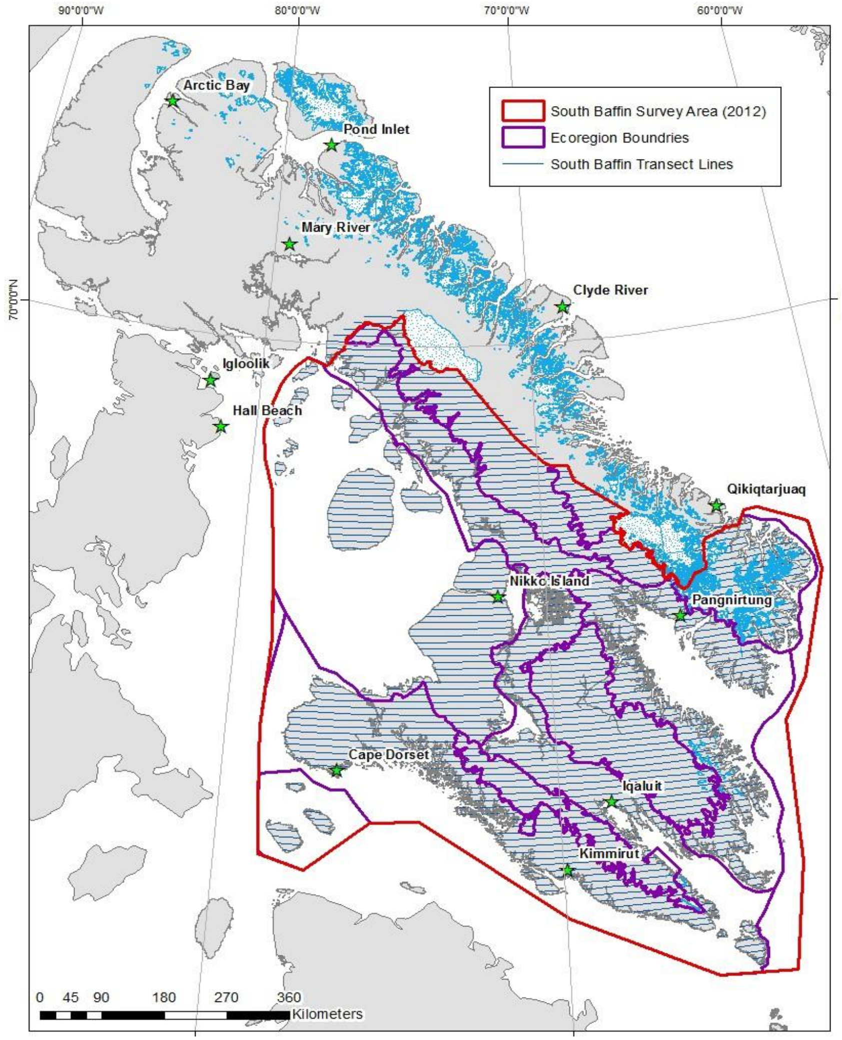


ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 2. ᐊᑲᑦᑐᖅᓯᒪᓂᐅᔪᖅ (ᑕᐃᒫᒃ ᓇᓗᓇᐃᔭᖅᑕᐅᓯᒪᒻᒪᑕ ᖃᐅᔨᓴᖅᑎᓄᑦ ᐱᓕᕆᔨᓄᑦ , 1995) ᐃᓗᐊᓂ ᓂᕆᐊᑕ ᕿᑭᖅᑖᓘᑉ ᖃᐅᔨᓴᕐᕕᐅᕝᕕᐅᑉ (2012).

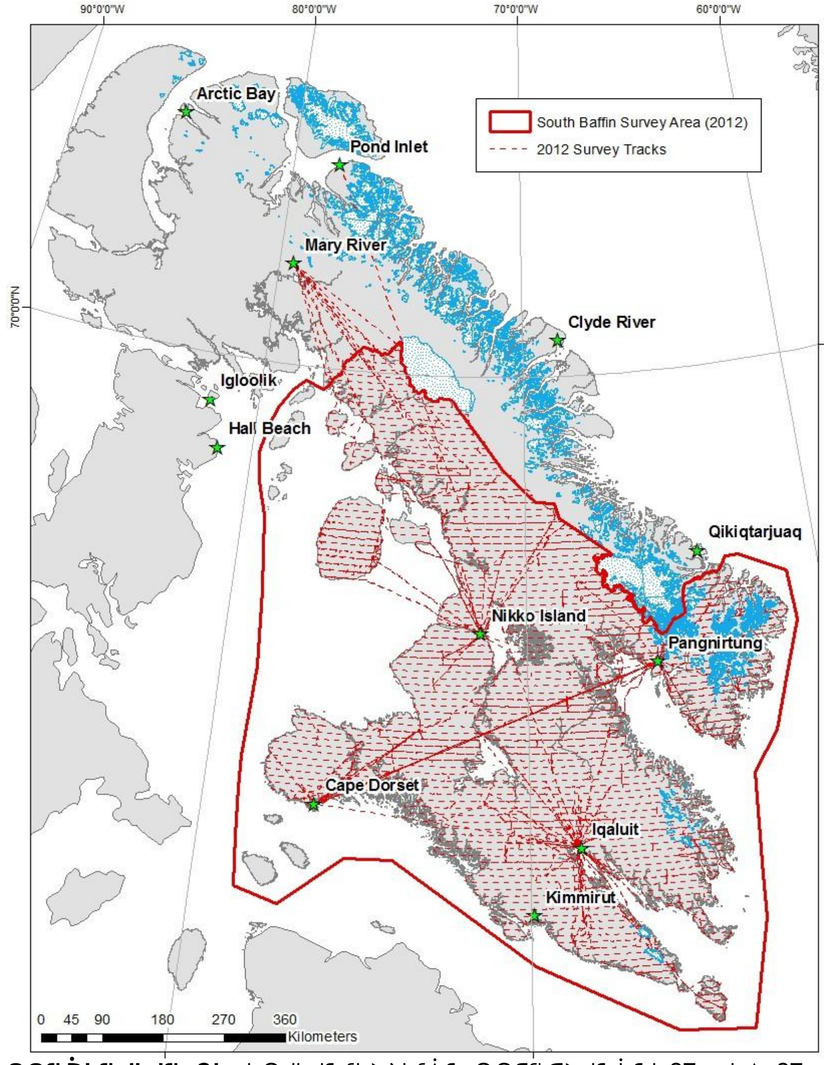
ᑎᑎᖅᑐᕐᕕᒃ 1. ᐃᓂᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ ᐊᑐᓂᑦ ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᔪᓂ ᓂᕿᐊᓂ ᕿᑭᖅᑖᓗᐸ ᖃᐅᔨᓴᖅᑕᐅᕕᐅᔪᓂ.

ᐊᕕᑦᑐᖅᓯᒪᓂᖅ	#-ᑎᖏᑦ	ᐃᓂᖓ ᐊᕕᑦᑐᖅᓯᒪᓂᐅᑉ ᖃᐅᔮᓴᕐᕕᒻᒥ (sq.m)	ᐊᖏᓂᖓ ᐊᕕᑦᑐᖅᓯᒪᓂᐅᑉ ᖃᐅᔮᓴᖅᑕᐅᓯᒪᓐᖏᑐᖅ	ᐊᐅᔨᐃᑦᑐᓕᒃ ᐃᒻᒥᒃᑰᖅᑐᖅ (sq.m)	ᐊᖏᓂᖓ ᐃᒻᒥᒃᑰᖅᑑᑉ ᖃᐅᔮᓴᖅᑕᐅᓯᒪᔪᖅ
ᕿᑭᖅᑖᓗᒻᒥ ᐃᓐᓈᕈᐃᑦ	5	26012595670.674		4872533677.421	21140061993.253
ᐸᓐᓂᖅᑑᑉ ᐳᖅᑐᓂᖓ	26	34270825269.184		608273899.173	33662551370.011
Hall Peninsula ᐳᖅᑐᓂᖓ	27	35388340567.403		126377399.698	35261963167.705
Meta Incognita ᑲᖏᖅᓱᖓ	28	71844146162.523		145402632.673	71698743529.850
Baffin ᐳᖅᑐᓂᖓ	29	16260276455.682		196814140.104	16063462315.577
ᕿᑭᖅᑖᓗᒻᒥ ᐳᖅᑐᓂᐅᔪᑦ	24	32202990217.572		18765207.435	32184225010.138
ᐃᒡᓗᓕᒃᐸᓯᒃ	25	44321511068.361	2059849192.963		42261661875.398
Melville ᑲᖏᖅᓱᖓᑕ ᓇᑎᕐᓇᖓ	23	26961031789.044			26961031789.044
ᐅᒃᑯᓯᒃᓴᓕᐅᑉ ᓇᑎᕐᓇᖓ	30	2452838712.381	2452838712.381		
	ᑲᑎᑦᓯᑎᒃ	**289714555912.824**	**4512687905.345**	**5968166956.505**	**279233701050.975**

ᐅᖃᐅᓯᖅ: *ᑲᑎᑦᓯᑎᒃ ᓄᓇᐃᑦ ᐊᑐᓂᑦ ᐊᕕᑦᑐᖅᓯᒪᔪᓂ ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᐊᑐᖅᓯᑎᒃ North-Pole-Lambert-Azimuthal-Equa-ᓂᕆᐅᕐᓯᐅᔪᓂᒃ ᑐᙵᕕᐅᔪᓂᒃ ᐊᑐᓂᑦ ᐊᕕᑦᑐᖅᓯᒪᓂᐅ27ᔪᓂ ᐃᒻᒥᒃᑯᑦ ᓈᓴᐅᓯᖅᑕᐅᑦᓯᑎᒃ. "ᐃᓂᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᖏᑦᑐᓂᒃ" ᐅᖃᐅᓯᖃᖅᑐᖅ ᐊᕕᑦᑐᖅᓯᒪᓂᐊᐅᑦ ᖃᐅᔨᖅᑕᐅᒍᒫᕐᓂᐊᖅᓯᒪᔪᑦ 2012-ᒥ, ᑭᓯᐊᓂ ᐱᔮᐅᓯᒪᓐᖏᑦᑐᑦ ᓯᓚᕐᓂᑦᓗᒃ ᐱᑦᓗᒍ ᐊᒻᒪᓗ ᐃᒪᖃᕐᓂᖅ (ᑕᑯᓗᒍ ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 3b).*



ᑎᑎᖅᑑᕐᕆᓯᒪᔪᖅ 3a. ᖃᖃᖅᑖᓘᑉ ᓂᒋᐊᓂ ᖃᐅᔨᓴᖅᑲᐅᓯᒪᔪᑦ, ᐊᑯᓐᓂᑖᑦ 10km ᐃᒻᒥᒃᑯᐊᖅᑎᖅᓯᒪᑦᓯᑎᒃ ᐊᕝᕌᖅᓯᒪᔪᖅᑎᒍᑦ.



ᑎᑎᖅᑑᕐᕆᓯᒪᔪᖅ 3b. ᑲᑎᓯᒪᔪᑦ ᖃᐅᔨᓴᖅᑳᑦ, ᑎᑎᕋᖅᑕᐅᔪᑦ ᒫᑦᓯ 27 - ᒪᐃ 27, 2012 ᑕᒻᒪᓈᒃᑯᑎᑎᒍᑦ ᖁᑏᒍᓕᒃᑯᑦ. ᐱᖓᓱᑦ ᖃᖃᖅᑕᐃᑦ ᑕᓯᐅᕐᖓᐊᑉ ᐃᑭᕋᓴᖕᖠᐊᖓᓂ ᐊᒻᒪᓗ ᓯᑕᒪᑦ ᖃᖃᖅᑕᐃᑦ ᐃᒡᓗᓕᐅᑉ ᐃᒪᖓᓂ ᐱᔭᓈᖅᑕᐅᔪᓐᖏᑦᑐᑦ ᐱᔾᔪᑕᐅᑦᓯᓂ ᐃᒪᖅ ᓯᓚᕐᓂᓗᒡᓗ.

ᑎᑎᖅᑐᕆᒃ 2: ᐃᓗᓐᓈᒍᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ ᑐᒦᑦᑐ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᕿᒻᒥ ᓯᓚᑖᓂᑐ

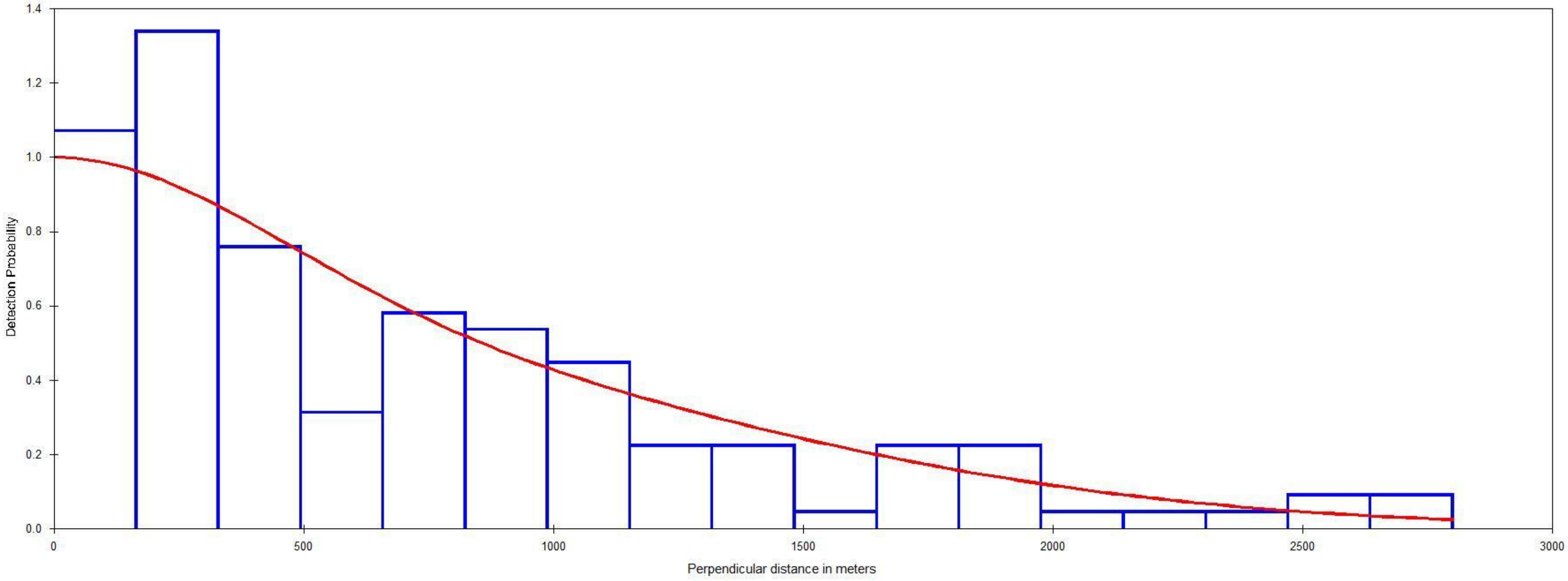
ᐆᒪᔪᐃᑦ	**ᖃᑦ ᓱᓂᒃ**	**ᑲᑎᑦᓱᑎᒃ ᐃᓄᐃᑦ**		ᖃᑦᓯᑦ ᑐ cks
ᑐᑦᑐ*	185	518		83
ᓇᓄᖅ	19	36	20 ᐃᓐᓇᐃᑦ 2916 ᕿᑐᕐᖓᐃᑦ	36
ᑎᕆᒐᓐᓂᐊᖅᖅ	13	14	11 Arctic, 1 Red, 2 not specified	51
ᐊᒪᕈᖅ	8	13		17
ᐅᑲᓕᖅ	5	8		17
ᐊᕿᒃ	4	15		
ᓇᑦᓯ	1	2		
ᐊᕿᒡᕖᑦ	10	31		
ᒥᑏᑦ	8	1102+	1089 ᒥᑏᑦ, 13 ᓇᓗᓇᐃᖅᓯᒪᓐᖏᑦᑐᑦ	
ᓂᕿᑌᑦ	12	48+	11 ᑲᖑᐃᑦ, 34 ᓂᕿᑌᑦ, 3 ᓇᓗᓇᐃᖅᓯᒪᓐᖏᑦᑐᑦ	
ᐅᐸᒃ	5	5	4 ᐅᐸᒃ, 1 ᓇᓗᓇᐃᖅᓯᒪᓐᖏᑦᑐᖅ	
ᑎᒥᐊᑦ	5	44+	10 ᖁᐸᓄᐊᑦ, 34 ᓇᓗᓇᐃᖅᑕᐅᓯᒪᓐᖏᑦᑐᑦ	
ᓇᓗᓇᐃᖅᑕᐅᓯᒪᖏᑦᑐᖅ			ᑐᒦᑦ ᑐᑦᑑᓐᖏᑦᑐᑦ	87
ᐊᖑᓇᓱᑦᑎ/ᖃᒧᑕᐅᔾᖅ	9	28		258+

*ᑐᑦᑐᐃᑦ ᑐᒥᖏᑦ ᓱᕐᕋᓕᐅᔾᔭᐅᒋᐊᖃᕆᐊᖏᑦ ᑎᑎᕋᖅᓯᒪᔪᑦ; ᑐᒦᑦ ᐊᓯᖏᓐᓄᑦ ᐆᒪᔪᕐᓂᑦ ᓱᕐᕋᓕᐅᔾᔭᐅᓯᒪᓐᖏᑦᑐᑦ ᐊᑕᖏᓐᖏᑐᐃᓐᓇᕆᐊᖃᖅᓱᑎᒃ.

ᑎᑎᖅᑐᕐᕕᒃ 3. ᐃᓗᓕᖕᒋᑦ ᑐᑦᑐᐃᑦ ᑕᑯᔭᐅᔪ30 ᖃᐅᔨᓴᕐᕕᒻᒥ ᓯᓚᑖᓃᓗ

		ᖃᑦᓯᐅᓂᖕᒋᑦ ᑐᑦᑐᐃᑦ ᑕᑯᔭᐅᔪᑦ		
ᐊᕐᕿᒍᖕᒋᐊᕐᓇᖅ/ᐊᖑᑎ		**ᖃᐅᔨᓴᕐᕕᒻᒥ**	**ᓯᓚᑖᓂ**	**ᑲᑎᑦᓱᑎᒃ**
ᐱᓐᓂ ᐱᑦ	ᐊᖑᑏᑦ	94	35	129
	ᐊᕐᓇᐃᑦ	155	74	229
	ᖃᐅᔾᒪᔭᐅᓐ	0	0	0
	ᑲᑎᑦᓱᑎᒃ	**249**	**109**	**358**
ᐊᕐᕋᒍᓕᒃ	ᐊᖑᑏᑦ	42	11	53
	ᐊᕐᓇᐃᑦ	27	6	33
	ᖃᐅᔾᒪᔭᐅᓐ	3	4	7
	ᑲᑎᑦᓱᑎᒃ	**72**	**21**	**93**
ᓂᕐᕋᖅ	ᐊᖑᑏᑦ	11	0	11
	ᐊᕐᓇᐃᑦ	13	2	15
	ᖃᐅᔾᒪᔭᐅᓐ	10	14	24
	ᑲᑎᑦᓱᑎᒃ	**34**	**16**	**50**
ᖃᐅᔾᒪᔭᐅᓐ	**ᑲᑎᑦᓱᑎᒃ**	**3**	**14**	**17**

*ᖃᐅᔾᒪᔭᐅᓐᖏᑦᑐᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᓐᖏᑦᑐᑦ ᐊᕐᕿᒍᖕᒋᑦ ᐊᕐᓇᐅᓂᖕᒋᓪᓗ ᐊᖑᑕᐅᓂᖕᒋᓪᓗ. ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐃᓚᒍᑦᓯᐅᔅᔭᐅᓯᒪᔪᑦ ᕿᒥᕐᕈᔭᐅᓂᖕᒋᑦ ᐃᒻᒥᒃᑯᑦ ᓇᓗᓇᐃᖅᑕᐅᓯᒪᒍᓐᓇᖕᒋᑦᑐᑦ ᓄᕐᕋᐅᒋᐊᖕᒋᑦ.



ᑎᑎᖅᑑᔭᖅᓯᒪᔪᖅ 4 ᖃᐅᔨᔭᐅᑐᐃᓐᓇᕆᐋᓖᑦ (ᑲᔪᓯᔪᒥᒃ ᑎᑎᖅᓯᒪᔪᑯᑖᒃ) ᐃᓂᖓ ᐅᖓᓯᓐᓂᐅᔪᓪᓗ ᑎᑎᖅᑕᐅᓯᒪᔪᒥᒃ ᑲᑎᒪᐅᖅᑐᓄᑦ ᑐᑦᑐᓄᑦ ᓂᒋᐊᓂ ᕿᕿᖅᑖᓅᑉ ᖃᐅᔨᓴᖅᑕᐅᕕᒻᒥ, ᒫᑦᓯ 27, ᒪᐃ 27, 2012. G (x) ᓇᓚᐅᑦᕵᕈᑕᐅᔪᖅ ᐊᑐᖅᓱᑎᒃ ᐊᕝᕙᓪᓗᐊᕐᒋᓐᓂᒃ ᐊᑐᖅᑕᐅᔪᑦ ᑕᑯᓗᒍ ᑎᑎᖅᑐᕐᕕᒃ 5 ᐊᑖᓃ). ᐊᕐᒌᓂᖓ ᕗᓇᔭᐅᔫᑉ 165 ᒦᑕᐃᑦ.

ᑎᑎᖅᑐᕐᕕᒃ 4. ᓇᓗᓇᐃᔭᖅᓯᒪᔪᑦ MCDS ᐊᒻᒪᓗ CDS ᐊᐅᓚᓂᖅᑎᑦ ᐃᓱᒪᒋᔭᐅᔪᑦ ᖃᐅᔨᒍᑕᐅᓂᕐᒧᑦ, ᐊᑐᐃᓐᓇᐅᔪᓄᑦ covariates. Covariates ᐱᖃᓯᐅᔾᔨᔪᑦ ᒪᓃᑦᑐᒥ (ᒪᓃᑦᑐᒥ), ᐊᒻᒪᓗ ᒪᓂᕋᑦᑐᒥ ᑐᑦᑐᖃᕐᕕᓐᓂᒃ (ᒪᓂᕋᑦᑐᖅ). HN ᐊᑦᑐᐊᔪᖅ ᐊᖏᖕᒐᑕ ᐱᐅᓯᐅᑲᔪᑦᑑᑉ ᐊᒻᒪᓗ HR ᐅᓗᓇᐊᓇᖅᑐᓄᑦ, C ᐅᖃᐅᓯᖃᖅᑐᖅ Cosine ᐊᒻᒪᓗ SP ᐱᔭᓇᐊᑭᑦᑐᑦ ᑎᑎᖅᓯᒪᕕᖕᒐᓐᓄᑦ Par–ᖑᔪᑦ = ᖃᑦᓯᐅᓂᖏᑦ ᑭᓪᓕᑎᔭᐅᔪᑦ ᐋᖅᑭᑦᓯᒪᓂᕐᒥ, Delta AIC = ᐊᔾᔨᒌᙱᓂᖏᓂᖓ ᐊᑦᓯᓂᖅᐹᖅ AIC ᐊᒻᒪᓗ ᐊᑐᖅᑕᐅᔪᖅ AIC, D = ᓄᓇᕐᔪᐊᕐᒥ ᑲᑎᒪᐅᖅᑐᖅ ᓇᓚᐅᑦᓵᖅᑕᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᔪᒥ, D 95% CI = ᐊᑦᑐᐊᒍᑦ 95% ᓇᓗᒋᔭᐅᙱᓯᖅᑐᖅᑐᑦ ᐊᒍᓐᓂᐅᔪᑦ D, D CV–ᒧᑦ = ᑲᔪᓯᓂᖏᑦ ᐊᔾᔨᒌᙱᑦᑐᑦ, ᐊᒻᒪᓗ, N = ᓇᓚᐅᑦᓵᖅᑕᐅᓯᒪᔪᑦ ᖃᑦᓯᐅᓂᖏᑦ ᑐᑦᑐᐃᑦ ᖃᐅᔨᓴᖅᑕᐅᕕᒻᒥ, N 95% CI = ᐊᑦᑐᐊᔪᑦ 95% ᓇᓗᒋᔭᐅᙱᓯᖅᑐᖅᑐᑦ ᐊᒍᓐᓂᐅᔪᑦ N, ESW - ᑲᔪᓯᓂᖅᑲᑦᓯᐊᖅᑐᑦ ᑐᑭᒧᐊᑦᑑᑉ ᓯᓚᓐᓂᖕᒐᑕ, ᐱᖕᒐᓱᓪᓗ ᓈᒻᒪᑦᓯᐊᖅᑐᑦ (GOF), Chi p = a chi ᑭᑉᐹᓇᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᖅ, K-S p = a Kolmogorov-Smirnov, ᐊᒻᒪᓗ CvM = a Cramer-von Mises ᖃᐅᔨᓴᕐᓂᕐᒥᒃ.

ᐊᑎᖓ	Par	Delta AIC	AIC	D (km^2)	D 95% CI		D CV	N	N 95% CI		N CV	ESW	Goodness of Fit		
					ᐊᑦᓯᑦᑐᖅ	ᖁᑦᓯᑦᑐᖅ			ᐊᑦᓯᑦᑐᖅ	ᖁᑦᓯᑦᑐᖅ			Chi p	K-S p	CvM
HN_MCDS_Coarse	2	0.00	2118.171	0.0053	0.0038	0.0074	0.170	1484	1065	2067	0.17	1036.46	0.124	0.562	0.400
HN_MCDS _Fine	2	2.10	2120.275	0.0056	0.0040	0.0078	0.171	1552	1113	2165	0.17	1048.87	0.110	0.426	0.300
Hz_Sp_CDS*	2	15.94	2134.113	0.0064	0.0044	0.0093	0.191	1789	1234	2593	0.19	909.82	0.259	0.666	0.900
Hz_C_CDS*	2	15.94	2134.113	0.0064	0.0044	0.0093	0.193	1789	1230	2602	0.19	909.82	0.259	0.666	0.900
HN_C_CDS	2	17.37	2135.541	0.0059	0.0042	0.0084	0.177	1656	1174	2336	0.18	983.24	0.181	0.618	0.700
Hz_MCDS_Coarse	3	22.26	2140.431	0.0047	0.0031	0.0072	0.219	1314	859	2009	0.22	1238.77	0.040	0.049	0.050
HN_H_CDS*	1	24.25	2142.418	0.0048	0.0033	0.0070	0.195	1330	910	1943	0.20	1223.56	0.016	0.018	0.050

*ᐊᐅᓚᓂᐅᔪᑦ ᖃᐅᔨᒃᑲᖅᓵᓇᒍᑎᓖᑦ

ᑎᑎᖅᑐᕋᒃ 5: ᓇᓚᐅᑦᖠᖅᑕᐅᓯᒪᔪᑦ ᑐᑦᑐᐃᑦ ᑲᑎᒪᐅᓂᖕᖏᑦ ᐊᒥᓷᓂᖕᖏᓪᓗ ᐃᓗᐊᓂ 8 ᐊᔾᔨᒌᓐᖏᑦᑐᑦ ᖃᐅᔨᓴᕋᐅᔪᑦ ᑐᑭᓕᐊᖅᑐᑎᒍ33 ᖃᐅᔨᓴᕐᓂᖅ. ᑐᓐᖓᕋᖃᖅᓱᑎᒃ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᓂᒃ ᐊᐅᓚᓂᖅ ᐅᖓᓯᓐᓂᓚᒻᒥ 6. ᖃᐅᔨᓴᕈᑏᑦ ᑲᓇᑕᒥ ᐃᓕᑕᕆᔭᐅᓯᒪᔪᑦ ᐊᕕᑦᑐᖅᓯᒪᓂᐅᑎᓪᓗᒋᑦ ᐊᒻᒪᓗ BIU – ᕿᑭᖅᑖᓗᒻᒥ ᐳᖅᑐᔪᑦ ᓘᓇᐃᑦ, = BU ᕿᑭᖅᑖᓗᒻᒥ ᐳᖅᑐᔪᐃᑦ, FBP = ᐃᒡᓗᓕᖅᐸᓯᒻᒥ, HPU = Hall Peninsula ᐳᖅᑐᓂᖓᓂ = MIP – Meta Incognita Peninsula, MPP = ᖃᐅᓱᐃᖅᑐᖅᐸᓯᒻᒥ ᓇᑎᕐᓇᖅ = PU ᐸᓂᖅᑑᒥ ᐳᖅᑐᓂᖅ, BM –ᕿᑭᖅᑖᓗᒻᒥ ᐃᓐᓈᕈᐃᑦ BM = ᕿᑭᖅᑖᓗᒻᒥ ᐃᓐᓈᕈᐃᑦ, km ᑐᑭᓗᐊᖅᑐᑦ = ᑕᑭᓂᓪᓗᐊᖏᑦ ᑐᕋᐃᓐᓇᖅᑐᑦ ᑭᓗᒨᑕᐃᑦ = ᑕᑭᓂᖓ ᑐᑭᓕᐊᖅᑑᒃ ᖃᐅᔨᓴᖅᑕᐅᔫᒃ ᑭᓗᒨᑕᓂ, Obs=ᓈᓴᐅᑏᑦ ᐅᖓᓯᑦᑐᒥᒃ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᐋᖅᑭᒋᐊᖅᑕᐅᔪᑦ ᓈᒻᒫᓈᓇᐊᖅᓱᑎᒃ ᓴᖑᐃᖓᔪᓄᑦ ᑭᖑᕐᖓᓂ 2800 m, D = ᓇᓚᐅᑦᖠᖅᑕᐅᔪᑦ ᑐᑦᑐᖃᕐᓂᖓᓂᒃ (ᐊᑐᓂᑦ km2), N=ᓇᓚᐅᑦᖠᖅᑕᐅᓯᒪᔪᑦ ᑐᑦᑐᐃᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᓂ, CV = ᐊᔾᔨᒌᓐᓂᖏᓂᖏᑦ D ᐊᒻᒪᓗ N, ᐊᒻᒪᓗ Km^2 = ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᖅ

Strata	Km Lines	Obs	D (km²)	D CV	N	N CV	Km²
BIU	3280.00	3	0.00094	0.57	30	0.57	32184.23
BU	1595.42	3	0.00193	0.58	31	0.58	16063.46
FBP	4105.43	102	0.02556	0.21	1081	0.21	42261.66
HPU	3601.04	8	0.00228	0.43	81	0.43	35261.96
MIP	6968.16	8	0.00118	0.41	85	0.41	71698.74
MPP	2689.61	14	0.00535	0.40	144	0.40	26961.03
PU	3182.19	3	0.00097	0.58	33	0.58	33662.55
BM	1827.24	0	0	0.00	0	0.00	21140.06
Pooled	**27249.88**	**141**	**0.00531**	**0.17**	**1484**	**0.17**	**279233.7**